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Sup. Ct

TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1946

No. 208

TRANSPARENT-WRAP MACHINE CORPORATION,
PETITIONER,

vs.

STOKES & SMITH COMPANY

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

PETITION FOR CERTIORARI FILED JUNE 18, 1946.

CERTIORARI GRANTED OCTOBER 14, 1946.

INDEX

	PAGE
Statement Required by Rule 13(4)	1
Complaint	2
Answer	6
Plaintiff's Reply to Defendant's Counterclaim	13
Agreed Transcript of Testimony	16
Plaintiff's Motion for Injunction	17
Ruling by the Court on Plaintiff's Application for Injunction	18
Plaintiff's Case	21
Defendant's Case	22
Witnesses for Defendant:	
Walter R. Zwoyer, Direct	22
Cross	68
Plaintiff's Rebuttal	80
Witness for Plaintiff in Rebuttal:	
Carl E. Schaeffer, Direct	82
Opinion	295
Final Judgment	303
Notice of Appeal	305
Stipulation as to the Contents of the Record on Appeal	306
Stipulation of Counsel as to Correctness of Record	310
Clerk's Certificate	311

EXHIBITS.

PLAINTIFF'S EXHIBITS:

	Admitted at Page	Printed at Page
No. 1—Agreement of June 23, 1937 between Transparent-Wrap Machine Corpn. and Stokes & Smith Co.	20	90
No. 2—Letter dated January 22, 1944, to Stokes & Smith Co. from Transparent-Wrap Machine Corpn. containing demand for assignment of four patents enumerated therein	20	105
No. 3—Letter dated April 17, 1944, from Transparent-Wrap Machine Corpn. to Stokes & Smith Co. advising defendant was initiating arbitration proceedings	21	107
No. 4—Letter dated April 29, 1944, from Transparent-Wrap Machine Corpn. to Stokes & Smith Co. concerning termination of agreement	21	108
No. 5—Fourteen patents involved in the controversy	21	109
No. 6—Letter dated July 28, 1937, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn.	69	233
No. 7—Letter dated October 29, 1937, to Transparent-Wrap Machine Corpn. from Stokes & Smith Co.	81	235
No. 8—Letter dated September 1, 1939, from Transparent-Wrap Machine Corpn. to Stokes & Smith Co.	81	236
No. 9 for Id.—List of Machines and Prices billed to Transwrap Machine Corpn. and H. Heide, Inc.	82	.....

	Admitted at Page	Printed at Page
No. 10—Transcript of experimental expenses on Transwrap machines	83	238
No. 11—Record of amounts expended by Stokes & Smith Co. in advertising the Transwrap machine	84	241
No. 12—List of patent expenses in procuring patents	84	242
DEFENDANT'S EXHIBITS:		
A-1—Patent No. 1,986,422	22	243
A-2—Patent No. 2,037,555	22	259
A-3—Patent No. 2,047,243	22	264
B—Letter dated October 7, 1935, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn. referring to filling machines	27	269
C—Letter dated October 29, 1935, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn.	29	270
D—Letter dated November 15, 1935, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn., requesting agreement for sales commissions	30	271
E—Letter dated November 26, 1935, from Transparent-Wrap Machine Corpn. to Stokes & Smith Co. in answer to Exhibit D	30	272
F-1—Letter dated March 20, 1936, from Stokes & Smith Co. to Henry Heide, Inc.	65	273
F-2—Letter from Stokes & Smith Co. to Transparent-Wrap Machine Corpn.	65	278
G—Circular of Stokes & Smith Co.	44	279

	Admitted at Page	Printed at Page
H—Strip of Packages filled with confection	45	Physical
I—Strip of Packages with no contents	46	Physical
J—Patent on cheese package 2,383,352	56	Physical
K—Letter dated September 17, 1942, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn. re patents	57	280
L—Letter dated February 27, 1939, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn. re royalty reductions	58	281
M—Letter dated January 26, 1944, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn.	60	287
N—Letter dated May 2, 1944, from Stokes & Smith Co. to Transparent-Wrap Machine Corpn.	61	288
O—Requirement of the Patent Office that the Zwoyer patents be divided	62	294

Proceedings in U. S. C. C. A., Second Circuit	312
Opinion, Hand, J.	322
Dissenting opinion, Swan, J.	322
Judgment	324
Petition for rehearing	325
Order denying petition for rehearing	330
Clerk's certificate (omitted in printing)	331
Order granting certiorari	332

United States Circuit Court of Appeals

For the Second Circuit

STOKES & SMITH COMPANY,
Plaintiff-Appellant,

vs.

TRANSPARENT-WRAP MACHINE CORPORATION,
Defendant-Appellee.

Statement Required by Rule 13(4):

1. Complaint filed and summons issued May 19, 1944. Summons served and return filed May 23, 1944.

2. The plaintiff-appellant is Stokes & Smith Company, a Pennsylvania corporation. The defendant-appellee is Transparent-Wrap Machine Corporation, a New York corporation.

3. Complaint filed May 19 1944.
   Answer and counterclaim filed June 15, 1944.
   Plaintiff's reply to defendant's counterclaim filed June 27, 1944.

4. Trial had before Judge CLANCY November 8th and 9th, 1945.

5. No matter was referred to Commissioner, Master or Referee.

6. Final judgment entered on December 28, 1945.
   Notice of appeal filed January 7, 1946.

4

Complaint.

(Filed May 19, 1944.)

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,

Plaintiff,

vs.

5 TRANSPARENT-WRAP MACHINE CORPORATION,

Defendant.

Civil Action No. 25-583

Plaintiff, complaining of defendant, says:

1. Plaintiff, Stokes & Smith Company, is a corporation duly organized and existing under and by virtue of the laws of the Commonwealth of Pennsylvania, having offices at 4900 Summerdale Avenue, Philadelphia, Pennsylvania.

2. Defendant, Transparent-Wrap Machine Corporation,
6 is a corporation duly organized and existing under and by virtue of the laws of the State of New York with offices at 313-321 Hudson Street, New York, New York.

3. This is a suit for a declaratory judgment under Section 274-D of the Judicial Code, Title 28, U.S.C. 400, and the jurisdiction of this Court is predicated upon the diversity of citizenship of the parties and upon the fact that the amount in controversy is in excess of Three Thousand Dollars ($3,000), exclusive of interest and costs.

4. On June 23, 1937 plaintiff and defendant entered into an agreement in writing, a copy of which agreement is attached hereto and profert of which is hereby made.

5. By virtue of said agreement defendant granted and plaintiff acquired an exclusive license under certain patent rights therein identified upon the terms and conditions therein recited.

6. Defendant has asserted to plaintiff, orally and in writing, that paragraphs 11 and 12 of the said agreement impose upon plaintiff obligation to assign to defendant any inventions and patent rights made or acquired by plaintiff capable of use with the machines forming the subject matter of the agreement and whether or not included in or covered by the patents of defendant; and to continue to pay defendant the royalties prescribed by the said agreement after the expiration of defendant's patents upon which the agreement is based, whereby defendant is improperly using its patent rights to create and maintain a monopoly other than and different from the monopoly created by its patents.

7. Plaintiff has made or acquired certain inventions and Letters Patent of the United States therefor other than, different from, and outside of defendant's patents, and defendant, by reason of said agreement, and particularly paragraphs 11 and 12 thereof, has demanded that plaintiff assign said inventions and patents to defendant, but plaintiff has disputed the propriety and the legality of the demand and has refused to comply therewith additionally because to do so would be contrary to public policy and would require plaintiff to be a party to the improper use of defendant's patents.

8. Paragraph 16 of the said agreement provides that in the event that any dispute, controversy or claim shall arise between defendant and plaintiff out of or relative to the agreement or the breach thereof, and whether or not an event of default has occurred, the same shall be settled by arbitration.

10 *Complaint*

9. On or about April 17, 1944 by a letter in writing signed by Henry Heide, Jr., Secretary of defendant, plaintiff was notified by defendant that because of the dispute between plaintiff and defendant as to plaintiff's obligation to assign its patents to defendant, defendant was taking steps to have the matter referred to arbitration in accordance with Paragraph 16 of the agreement.

10. Thereafter, to wit: on April 29, 1944, by a letter in writing signed by Herman L. Heide, Director and Treasurer of defendant, plaintiff, was notified by defendant that de-
11 fendant was terminating the said license agreement, the termination to be effective May 10, 1944.

11. Plaintiff, since the date of the agreement, to wit: June 23, 1937, has expended large sums in creating and maintaining a large and constantly growing business under the said agreement valued at and amounting to many thousands of dollars and many times the statutory amount of Three Thousand Dollars ($3,000), and that the termination of said agreement by defendant would entail the complete loss to plaintiff of its business in an amount many times
12 Three Thousand Dollars ($3,000), and that plaintiff's patents are valued at many thousands of dollars, and specifically many times Three Thousand Dollars ($3,000).

12. That by reason of the foregoing a justiciable controversy exists between plaintiff and defendant as to the propriety of plaintiff being required to assign its patents to defendant; as to the right of defendant to terminate the said agreement because of plaintiff's refusal to assign its inventions and patents to defendant; as to whether or not, prior to termination, defendant is obligated by the agreement to arbitrate the dispute between plaintiff and defendant and as to the interpretation and enforceability of the provisions of paragraphs 11 and 12 thereof.

WHEREFORE plaintiff prays—

FIRST: That a writ of subpoena issue out of and under the seal of this Court requiring defendant to make answer hereto.

SECOND: For a declaratory judgment of invalidity and/or non-enforceability of said paragraphs 11 and 12 of the said agreement of June 23, 1937 because of defendant's improper use of its patents in contravention of public policy.

THIRD: For a preliminary and permanent injunction restraining defendant from terminating the said agreement of June 23, 1937 because of any alleged and disputed breach thereof by plaintiff unless and until by arbitration it has been initially held that a breach has occurred.

FOURTH: For a preliminary injunction restraining defendant from taking any action of any kind during the pendency of this case and prior to final adjudication, and permanently thereafter, which would impair, damage or mitigate against the exclusive rights vested in plaintiff by the said agreement during its term and any and all extensions thereof.

FIFTH: For the costs of this action.

SIXTH: For such other and further relief as to the Court may seem just and the circumstances warrant.

STOKES & SMITH COMPANY,
By DARBY & DARBY
Its Attorneys,
Office & Post Office Address
#405 Lexington Avenue
New York, 17, New York

SAMUEL E. DARBY, JR.,
VIRGIL E. WOODCOCK,
Of Counsel.

Dated: New York, N. Y.
May 19th, 1944.

16

Answer.

(Served—June 12, 1944.)

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,

Plaintiff,

against

17 TRANSPARENT-WRAP MACHINE CORPORATION,

Defendant.

Civil Action No. 25-583

The above named defendant, appearing herein by Amend & Amend, its attorneys, for its answer to the complaint of the plaintiff, respectfully shows and alleges:

FIRST: Defendant admits the allegations contained in paragraphs "1", "2", "3", "4", "5", "8", "9" "10" and "11" of plaintiff's complaint.

18

SECOND: Admits that it has demanded of the plaintiff that plaintiff assign certain letters patent to it, as alleged in paragraph "6" of plaintiff's complaint, and denies each and every other allegation contained therein.

THIRD: Denies each and every allegation contained in paragraph "7" of plaintiff's complaint, except the allegation that the defendant has demanded that plaintiff assign to it the inventions and letters patent acquired by the plaintiff which are applicable to the Transwrap Packaging Machine and applicable to the making and closing of the package.

FOURTH: Denies each and every allegation contained in paragraph "12" of plaintiff's complaint. 19

FURTHER ANSWERING THE COMPLAINT OF THE PLAINTIFF, AND AS A SEPARATE AND DISTINCT DEFENSE THERETO, THE DEFENDANT RESPECTFULLY SHOWS AND ALLEGES:

FIFTH: Paragraph 14 of the License Agreement, annexed as an exhibit to the complaint herein, reads, in part, as follows:

"14. In the event that any one or more of the following events (herein termed events of default) shall occur, and such default shall not be cured within thirty days after written notice thereof by the Licensor to the Licensee this agreement may be terminated by the Licensor in the manner hereinafter provided. 20

"The following and each of the following shall constitute events of default:

* * * *

"(h) If the Licensee shall default in any of the terms, clauses, covenants and conditions of this License Agreement. 21

"Should such an event of default have occurred and not been cured within thirty days after written notice thereof by the Licensor to the Licensee, this license shall be deemed terminated upon a date fixed in a further written notice of termination to be sent by the Licensor to the Licensee by registered mail, which date shall not be less than ten days after the expiration of the thirty days hereinabove referred to.

22 *Answer*

"Failure of the Licensor to insist upon any of the terms, clauses, covenants and conditions of this License Agreement in any instance shall not, however, be deemed to be a waiver of default in subsequent instances."

SIXTH: That during the month of January, 1944, the defendant learned that the plaintiff, its officers, agents or employees, had, at various times after entering into the said License Agreement with the defendant, applied for
23 letters patent upon certain inventions useful in connection with the machine which is the subject of the License Agreement between the defendant and the plaintiff; that many letters patent on said inventions had been granted to the plaintiff; and that the plaintiff had not afforded the defendant the opportunity to apply for said letters patent, in accordance with the provisions of paragraph "12" of said License Agreement.

SEVENTH: Defendant, on January 22, 1944, pursuant to the provisions of paragraph "14" of said License Agreement, gave written notice to the plaintiff of the respects in
24 which defendant claimed that the plaintiff had breached the said License Agreement. A copy of said written notice is annexed hereto and marked "Exhibit A".

EIGHTH: That plaintiff has heretofore, orally and in writing, acknowledged to the defendant that it, the plaintiff, had breached the said License Agreement by applying for such letters patent on inventions useful in connection with the machine which is the subject of said License Agreement, without affording the defendant an opportunity to apply for such letters patent.

NINTH: That plaintiff failed and neglected, within thirty days after said written notice from the defendant

(Exhibit A hereto annexed) to cure the defaults referred to in said notice.

TENTH: That the defendant by letter to the plaintiff dated April 29, 1944, a copy of which is annexed hereto and marked "Exhibit B", fixed a date for the termination of said License Agreement, which date was not less than ten days after the expiration of the thirty day period referred to in paragraph "Ninth" hereof.

FURTHER ANSWERING THE COMPLAINT OF THE PLAINTIFF, AND AS AND FOR A COUNTERCLAIM, THE DEFENDANT RESPECTFULLY SHOWS AND ALLEGES:

ELEVENTH: The defendant repeats and realleges, with the same force and effect as if herein at length set forth, each and every allegation contained in paragraphs "Fifth", "Sixth", "Seventh", "Eighth", "Ninth" and "Tenth" hereof.

TWELFTH: On information and belief, that the plaintiff, through its officers, agents or employees, has obtained letters patent on inventions useful in connection with the machine which is the subject of said License Agreement, as follows:

License Number	*Date*	*Name of Inventor*	*Title of Invention*
2,145,941	February 7, 1939	Maxfield	Method of and Apparatus for Making Packages
2,146,308	February 7, 1939	Maxfield	Method of Making Packages
2,146,831	February 14, 1939	Maxfield	Method of Making Containers
2,154,521	April 18, 1939	Maxfield	Method of Manufacture of Filled Container
2,160,367	May 30, 1939	Maxfield	Method of Making Sealed Packages

License Number	*Date*	*Name of Inventor*	*Title of Invention*
2,199,708	May 7, 1940	Maxfield	Method of and Apparatus for Feeding Web Material
2,200,971	May 14, 1940	Sonneborn, et al.	System for Making, Filling, and Sealing Containers
2,257,433	September 30, 1941	Stokes	Method of and Apparatus for Manufacture of Sealed Packages
2,257,823	October 7, 1941	Stokes	Method and Apparatus for Producing Containers
2,259,866	October 21, 1941	Stokes	Method of Making Containers
2,260,064	October 21, 1941	Stokes	Method of Making Containers
2,294,215	August 25, 1942	Sonneborn, et al.	Apparatus for Making Containers
2,294,220	August 25, 1942	Albertson	Method of and Apparatus for Making Containers
2,330,015	September 21, 1943	Stokes	Container

THIRTEENTH: That defendant has duly demanded of the plaintiff that the plaintiff cause the said letters patent referred to in paragraph "Twelfth" hereof to be assigned to the defendant, and the plaintiff has failed, neglected and refused to cause said letters patent to be so assigned, in accordance with the terms of said License Agreement.

FOURTEENTH: That by reason of the foregoing facts and circumstances, the defendant has suffered considerable pecuniary damage by having been deprived of its rights under paragraphs "11" and "12" of the License Agreement to apply for and obtain patents and license the use thereof in countries outside the several territories covered by the License Agreement covering the inventions forming

the subject matter of the letters patent enumerated in paragraph "Twelfth" hereof, and that said damage amounts to $100,000.

WHEREFORE, defendant demands judgment that:

(a) the complaint of the plaintiff herein be dismissed with the costs to the defendant;

(b) the plaintiff assign, transfer and set over unto the defendant the said letters patent above set forth;

(c) the said License Agreement between the defendant and the plaintiff has been terminated by the defendant, in accordance with the terms and provisions of said License Agreement;

(d) the plaintiff be enjoined and restrained from using any of the letters patent which are the subject of said License Agreement and/or which are referred to in the counterclaim herein; and

(e) the defendant recover from the plaintiff damages in the amount of $100,000.

TRANSPARENT-WRAP MACHINE CORPORATION

By (sgd) AMEND & AMEND
Its Attorneys

Office & Post Office Address:
135 William Street,
Manhattan, New York 7, N. Y.

ABRAHAM ENGEL
MYLES B. AMEND
TERENCE J. MULLEN
Of Counsel

34

Exhibit A.

(Annexed to Answer.)

In evidence as Plaintiff's Exhibit 2, and reproduced at page 105.

Exhibit B.

35 (Annexed to Answer.)

In evidence as Plaintiff's Exhibit 4, and reproduced at page 108.

36

Plaintiff's Reply to Defendant's Counterclaim.

37

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,
Plaintiff,
vs.
TRANSPARENT-WRAP MACHINE CORPORATION,
Defendant.

Civil Action No. 25-583

38

Plaintiff in reply to defendant's counterclaim herein says:

1. It admits the allegations of paragraph Fifth of the counterclaim as incorporated therein by paragraph Eleventh thereof.

2. Plaintiff admits the allegations of paragraph Sixth of the counterclaim as incorporated therein by paragraph Eleventh thereof except that it denies that it was during the month of January 1944 that defendant learned of the matters therein alleged; and plaintiff alleges to the contrary that defendant learned thereof at least as early as February 1939.

39

3. Plaintiff admits the receipt of the letter of January 22, 1944, attached to defendant's answer and counterclaim as "Exhibit A" but denies each and every other allegation of Paragraph Seventh of the counterclaim as therein incorporated by paragraph Eleventh thereof.

40 *Plaintiff's Reply to Defendant's Counterclaim*

4. Plaintiff denies each and every allegation contained in paragraph Eighth of the counterclaim as therein incorporated by paragraph Eleventh thereof.

5. Plaintiff denies each and every allegation contained in paragraph Ninth of the counterclaim as therein incorporated by paragraph Eleventh thereof.

6. Plaintiff admits the receipt of the letter dated April 29, 1944, a copy of which is annexed to defendant's answer and counterclaim as "Exhibit B" but denies each and every
41 other allegation contained in paragraph Tenth of the counterclaim as therein incorporated by paragraph Eleventh thereof.

7. Plaintiff denies each and every allegation contained in paragraph Twelfth of the counterclaim.

8. Plaintiff denies each and every allegation contained in paragraph Thirteenth of the counterclaim save that plaintiff admits that it has made or acquired certain inventions and letters patent of the United States therefor, other
42 than, different from, and outside of defendant's patents and that defendant, by reason of the said agreement between plaintiff and defendant of June 23, 1937, and particularly paragraphs 11 and 12 thereof, has demanded that plaintiff assign said inventions and patents to defendant, but plaintiff has disputed the propriety and legality of the demand and has refused to comply therewith additionally because to do so would be contrary to public policy and would require plaintiff to be a party to the improper use of defendant's patents.

9. Plaintiff denies each and every allegation contained in paragraph Fourteenth of the counterclaim.

10. Further answering the counterclaim, plaintiff, on information and belief, alleges that at least as early as February 1939, defendant was advised and had knowledge of the fact that inventions of or obtained by plaintiff were being protected by applications for Letters Patent of invention of the United States but defendant then did and said nothing and for years thereafter did and said nothing in protest thereto, whereby at great effort and expense 44
plaintiff continued to make and acquire other and additional valuable inventions and applications for Letters Patent therefor and Letters Patent therefor other than, different from, and outside of defendant's patents, wherefore defendant is barred from its laches and by equitable estoppel from the relief defendant asks in its counterclaim.

WHEREFORE, plaintiff denies that defendant is entitled to the relief that it prays for or to any relief and, therefore, asks that the counterclaim be dismissed with costs; and plaintiff asks for such other and further relief with respect thereto as to the Court may seem just and the circum- 45
stances warrant.

STOKES & SMITH COMPANY
By DARBY & DARBY
Its Attorneys
Office & P. O. Address
405 Lexington Avenue
New York 17, New York

SAMUEL E. DARBY, JR.
VIRGIL E. WOODCOCK
Of Counsel

Dated: New York, N. Y. June 27, 1944

46

Agreed Transcript of Testimony.

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH CO.,
Plaintiff,

vs.

47 TRANSPARENT-WRAP MACHINE CORPORATION,
Defendant.

Civ. 25-583

Before:

Hon. JOHN W. CLANCY, District Judge.

New York, November 8, 1945.

Appearances:

DARBY & DARBY, Esqrs., Attorneys for Plaintiff; SAMUEL E. DARBY, JR., Esq., and VIRGIL E. WOODCOCK, Esq., of Counsel.

48

AMEND & AMEND, Esqrs., Attorneys for Defendant; TERENCE J. MULLEN, Esq., of Counsel. By PENNIE, DAVIS, MARVIN & EDMONDS, Esqrs., R. MORTON ADAMS, Esq., and W. B. MORTON, JR., Esq., of Counsel.

* * * * * * * * * * *

T. 20

Mr. Darby: * * * it is our position that we are entitled to an injunction, restraining the termination of the agreement until an arbitration has been had.

I do not know whether this Court will proceed with the determination of the issue as to whether a breach has occurred or whether this Court will conclude this is a matter that should be, as provided by the agreement, passed upon by the American Arbitration Association, and hold this case in abeyance until that has been done. But to safeguard against the eventuality that this Court might—we do not think it should—but whether this Court should pass upon the merits of whether a breach has occurred, we also then ask for a declaratory judgment that paragraphs 11 and 12 are unenforcible. 50

• • • • • • • • • • •

T. 39

The Court: In the summary judgment motion did you defend on the ground you wanted a stay for arbitration?

Mr. Darby: No, sir.

The Court: You answered the counterclaim.

Mr. Darby: Yes.

The Court: You didn't attempt to stay the prosecution of that?

Mr. Darby: No, sir. 51

• • • • • • • • • • •

T. 42

The Court: You are asking for specific performance of *the agreement?*

Mr. Darby: In effect.

The Court: What you are asking for is that I stop specific performance.

Mr. Darby: No; I am asking for specific performance of paragraph 16 which requires arbitration on a matter of dispute as to whether or not there has been a default. We say there has been no default. I ask that they be enjoined from terminating this license agreement.

• • • • • • • • • • •

52 *Plaintiff's Application for Injunction*

T. 50

The Court: I think the best thing to do is to adjourn until 2 o'clock and see if I can check on some authorities.

You say when he started the lawsuit it was a waiver of his right to arbitrate?

Mr. Adams: Yes, your Honor, it was a waiver or they were in default—or it was conduct inconsistent with the right to arbitrate. Either way they are in default in proceeding with arbitration under the statute.

53 • • • • • • • • • • •

T. 57

(At 12.20 p. m. a recess was taken to 2.00 o'clock p. m.)

Afternoon Session.

Ruling by the Court on Plaintiff's Application for Injunction.

On January 22, 1944, defendant notified the plaintiff by registered mail that the defendant claimed the plaintiff was
54 in default, calling plaintiff's attention to the 30-day period for curing the default provided by paragraph 14.

On April 29, 1944, defendant notified the plaintiff that because of its failure to cure the default specified in the letter of January 22, 1944, the defendant determined to terminate the license agreement as of May 10, 1944.

On May 2, 1944, plaintiff wrote to defendant saying:

> "We were certainly at fault"

and further

> "we can only apologize for the breach in not submitting these matters to you."

Ruling

On May 19th this action was instituted. The prayer for judgment demands a declaratory judgment that two paragraphs of the agreement are invalid and unenforceable. It also asks for an injunction restraining the defendant from terminating the agreement until a breach has been established by arbitration. This demand could hardly be construed into a demand for specific performance of the arbitration clause of the agreement. But assuming that such a forced construction were made there is no fact pleaded which would support an action by the plaintiff for specific performance of the arbitration clause of the agreement. The elements of that cause of action or the conditions for its prosecution are set forth in section 4 of the arbitration statute. All of the conditions stated in that section are missing here. As an illustration: any refusal or failure of the defendant to embrace arbitration proceedings. None of them can be alleged because there is no dispute that none of them existed. It therefore appears that never at any time since the original demand was made by the plaintiff alleging the defendant's default, has the plaintiff done anything to secure a hearing by an arbitrator. It is also apparent that it stands in court today asking for a declaratory judgment of the invalidity of two sections of the license agreement. There must be a dispute to sustain an action for a declaratory judgment. Courts do not pass on moot questions, and the award of the judgment asked by the plaintiff requires the determination of the issue of fact; that is, whether or not the patents taken out by the plaintiff were such as to make its securing of such patents without consulting the defendant a violation of the agreement.

55 56 57

The action has been prosecuted thus far through a motion for summary judgment and has been sent out ready for trial by the Calendar Commissioner. The plaintff has never sought to halt the defendant's prosecution of its

58 *Ruling*

counterclaim; on the contrary, it answered on the merits. It has apparently prosecuted its own action for the relief of a declaratory judgment and now when that case is ready to be tried asks that the issue of fact, without deciding which its rights cannot be determined, be sent to an arbitrator. This is the first formal demand called to the attention of any judge of this Court for a hearing before an arbitrator. It is orally stated now that on the motion for summary judgment the arbitration clause was called to the attention of the judge then sitting. It is referred to in
59 plaintiff's brief but only by way of summing up his pleading. The arbitration clause never, so far as we can find, was submitted to any judge as a basis for any action by him or support for a demand that the prosecution of any branch of this litigation be stayed.

I hold that the plaintiff has quite deliberately waived its rights under the arbitration clause.

Mr. Darby: Shall we proceed with the trial on the merits then?

The Court: Yes, sir.

Mr. Darby: I offer in evidence a copy of the agreement of June 23, 1937.

60

(Marked Plaintiff's Exhibit 1.)

Mr. Darby: I offer in evidence copy of a letter dated January 22, 1944, to Stokes & Smith Co. from Transparent-Wrap Machine Corporation by Mr. William F. Heide, president; and for your Honor's information that is the letter of January 22nd where the demand for assignment of four patents enumerated therein was made.

(Marked Plaintiff's Exhibit 2.)

Mr. Darby: I offer in evidence the letter of April 17, 1944, from Transparent-Wrap Machine Corporation, signed

61

by Henry H. Heide, Jr., secretary, to Stokes & Smith Co., attention of Mr. J. S. Stokes; and for your Honor's information, that is the letter in which the defendant asserted that it was initiating arbitration proceedings.

(Marked Plaintiff's Exhibit 3.)

The Court: Wasn't that January 22nd?

Mr. Darby: No, that is April 17, 1944.

I offer in evidence the letter dated April 29, 1944, a letter from Transparent-Wrap Machine Corporation, signed by Herman L. Heide, director and treasurer, to Stokes & 62
Smith Company, attention of Mr. J. S. Stokes, president. For your Honor's information that is the letter in which termination of the agreement was mentioned.

(Marked Plaintiff's Exhibit 4.)

Mr. Darby: I offer in evidence a folder containing the 14 patents that are involved in the controversy. There is an index at the front of it.

(Marked Plaintiff's Exhibit 5.)

Mr. Darby: In view of the fact that the decision on the merits of the patents, in so far as the merits of the patents 63
are involved, will depend entirely upon the language of paragraph 12 of the agreement, I had not conceived it either necessary or desirable to have an expert witness in the case, because the patents speak for themselves, and in a very few moments I can take your Honor through one or two words in each of the patents which would enable, I believe, your Honor's decision as to whether or not it would come within the requirements of paragraph 12.

. . . . . .

T. 78

Plaintiff rests.

. . . . . .

64 **Defendant's Case.**

Zwoyer—Direct.

T. 80

WALTER R. ZWOYER, called as a witness on behalf of the defendant, being first duly sworn, testified as follows:

* * * * * * * * * * *

Direct examination by Mr. Adams.

Q. Mr. Zwoyer, would you tell us what your present occupation is? A. I am an assistant vice-president of the
65 Henry Heide Company, and vice-president of the Transparent-Wrap Machine Corporation.

Q. Do both companies have the same address? A. Yes, both companies have the same address, 313 Hudson Street.

Q. I show you United States Letters Patent 1,986,422, issued January 1, 1935, on an application filed November 28, 1933. United States Letters Patent 2,037,555, issued April 14, 1936, on an application filed November 28, 1933. And United States Letters Patent 2,047,243, issued July 14, 1936, on an application filed November 28, 1933, and ask
66 you whether you are the inventor named in those patents, and whether they are the patents identified in the license agreement between Transparent-Wrap Machine Corporation and Stokes & Smith, which is here in evidence? A. I am the inventor of these machines and they are the patents which are covered by this license agreement.

Mr. Adams: I offer the patents in evidence, and I understand that the plaintiff has no objection to my using soft copies, as Defendant's Exhibit A.

(Marked Defendant's Exhibit A.)

Q. Mr. Zwoyer, will you tell us briefly as to the time and circumstances under which you made this invention? A.

I was given a job by the Henry Heide Company to find some means of producing a package in which they could sell candy for one cent and yet be profitable.

After about six months the Transwrap machine was developed and placed in operation in the plant of the Henry Heide Company.

Q. Does this Patent 1,986,422 generally illustrate the machine that you built at that time? A. It does, and that machine is still in operation, making a slightly different package than the one shown in the patent.

Q. Will you briefly describe the nature of the machine 68
from the point of view of the operation that it performed in making, filling and sealing the packages of candy? A. The cellophane is drawn from a roll and passed over—

Q. Just before we do that, I think it would be better if we could have the patent before the Court. If you have any occasion to refer to the patent it would be well to be explicit about the parts or drawings you refer to so as to give some idea as to the nature of the operations involved. A. The cellophane is drawn from a roll and passed over a former.

Q. Let me interrupt you. I do not think anybody will object to my making this simple. When you say the cello- 69
phane, is that a roll of flat film? A. A roll or a strip of ribbon or film. Cellophane or any film which can be heat sealed.

After it is passed over the former, the overlapping edges are sealed under a roller, and at that time this die—the dies sealing the ends close on the tube form and start on a downward motion, going forward with sufficient film to form a package of a predetermined length.

Immediately after the dies are closed, starting on the downward motion, the feeding mechanism is set so it drops its charge into the package at this point, continuing to fill the package on its downward stroke.

70 *Zwoyer—Direct*

The feeding or dropping of the material into the package is completed slightly before the package is fully made.

At this time the dies open up and continue on an upward motion ready to renew the cycle, making a new package. When the dies are closed on the package—sealing the top of the preceding package made and the bottom of the new package to be made the knife comes into operation and cuts off the filled package previously formed.

Q. Would you look at the patent itself for a moment and point out to the Court by reference to Fig. 3 where the roll
71 of cellophane is shown?

Mr. Adams: Your Honor, this shows pretty closely the structure of the machine, although it will be a lot clearer if you see it. It would be convenient to identify the various parts. There are not so many.

Q. (Continuing.) I would ask Mr. Zwoyer therefore to point out the roll of cellophane? A. That is the roll of cellophane (indicating).

Q. It has a reference numeral 10. A. Or film. It is drawn down under a tension roller from No. 14, after which
72 it passes up over a former H.

Mr. Adams: Just let me pass to another figure which I think shows that former a little better.

Q. There is a Fig. 10 in which the former is shown, I believe, is that right? A. Yes.

Q. What does that former do to the cellophane? A. It helps to make the cellophane fold back upon itself.

Q. Into a tube? A. Yes, into a tube.

Q. I would also call your attention to Fig. 21, for example, and ask you to point out the mechanism for sealing the cellophane, after it is formed into a tube? A. The dies numbered 52 and 53 are the dies which heat and crease the

cellophane, sealing the end seal and drawing the film forward.

Q. How forward? A. They draw it in downward motion, causing the film to pass over the former in a downward motion.

Q. I notice in Fig. 21 that it shows some contents in each one of the packages. How does that get into the packages? A. By being measured out in a dispensing mechanism or feeding device which is placed immediately above the machine.

Q. Will you show us where that is illustrated in the 74
drawing? A. That is illustrated in this drawing. Fig. 5 has a practically complete dispensing mechanism (indicating).

Q. Is that also shown in Fig. 3 as part of the machine? A. It is also shown in Fig. 3 as part of the machine.

Q. Is the filling operation one of the operations that is essential in the operation of that machine? A. The filling operation is absolutely essential. Without the filling operation the rest of the machine would be of absolutely no value. It would operate only making empty packages.

Q. Would those packages be open or sealed? A. They 75
normally would be sealed, although a machine can make open packages by cutting them above the seal.

Q. Above the seal? A. Yes.

Mr. Adams: Now I call your Honor's attention at this point to the fact that one of these three patents, 2,037,555, is directed to that filling machanism alone.

I may say as appears from the patent itself that this patent is a division of Patent 1,986,422.

The fact is, and I do not think there will be any dispute about that, that that division resulted from a requirement of the Patent Office, because the Patent

76 Office took the view that the machine as a whole was one invention, but a filling mechanism was from their classification a separate invention and should be a separate patent.

Is that a fact, do you know that, Mr. Darby?

Mr. Darby: I do not know.

. . . . . .

T. 86

77 Mr. Adams: Now, while we are on the subject of the divisional patents, I might complete the subject by saying that the third of the patents, 2,047,243, is also a division of the original application devoting itself specifically to the cutting or severing knife-like mechanism which cuts the packages apart.

. . . . . .

T. 88

By Mr. Adams:

Q. When you built your first machine did you have a filling mechanism of a particular type? A. When I built
78 the first machine I had a volumetric measuring device on the machine.

Q. What do you mean by a volumetric measuring device on the machine? A. It is one which will measure a predetermined amount of material and place the same amount in each package formed.

Q. Did you have any contact with Stokes & Smith in connection with that? A. No, that was designed and on the machine before I had ever heard of Stokes & Smith's existence.

Q. Did you have any contact with them at about that time with respect to filling mechanisms? A. I had absolutely no contact with them about filling mechanisms at all

until practically almost a year after a machine was already designed and in operation.

Q. What was that in relation to? A. The purchasing from them of the necessary parts for the handling of powder on a machine which I had sold to a concern in Mexico City.

Q. Was the Stokes & Smith Company in the business of making filling devices for packages? A. Stokes & Smith were in the business of making filling devices, especially for powders. That is how I came to contact them.

Q. Did they also make other machinery? A. Stokes & 80
Smith, to my knowledge, did make various types of measuring devices and feed devices. Cardboard box machinery and complete filling and closing devices for the packaging of salt and products similar thereto.

Q. Tell us something about the fillers or filling machines that they made. What were they like? A. The Stokes & Smith augur filling device is a machine equipped with a vertical augur which will deposit a predetermined amount of material into a container by determining the number of revolutions made by the augur or by the time that the clutch of the augur is in contact with the cam.

81

Q. Now, I have here a letter from the Stokes & Smith Company of October 7, 1935, from Mr. Maxfield of that company, to Mr. Zwoyer of Transparent-Wrap Machine Corporation, which refers to their filling machines. Does that relate to that transaction that you are talking about? A. Is that one of the letters that you sent to me last night?

Q. Yes. I can give you a copy. A. This letter is in reference to the augur feed apparatus which I purchased from them for the first Transparent-Wrap machine built with the augur attachment.

Mr. Adams: At this time I would like to offer that in evidence as Defendant's Exhibit B.

82 *Zwoyer—Direct*

Mr. Darby: No objection.

(Marked Defendant's Exhibit B.)

Q. Tell us what you did with respect to manufacturing these machines or selling them, or exhibiting them to the public for sale? A. We built approximately ten or twelve of these machines and they were used—

Q. At what time was that? A. This was early in 1934 after the patent application was put in and before it was granted.

83 The duPont Company saw the operation of the machines and advertised the possibility of making packages in this manner.

The machine became quite popular and we were requested to bring several of these machines to Europe, at which time Herman Heide and myself made a trip to England, Germany and Austria, and finally made a contract with a concern in England to manufacture the machines for England—for all of Europe.

After we came back the machine in this country aroused quite a lot of interest and we sold a number of these machines in the confectionery industry, after which various

84 other items such as packaging of coffee and drug products were packed on our machine.

Q. Now, did the Stokes & Smith Company approach you to get manufacturing or selling rights with respect to your machine? A. Through the discussion I had with Mr. Maxfield, he asked us to allow them to make and sell the machine, and I remember we offered them a commission for the sale of the machine for a limited territory.

After some time Mr. Maxfield wanted us to allow them to build and sell the machine. For a while this discussion went on and then was finally dropped.

Sometime later, I don't remember just how far or how long it was, Mr. Maxfield contacted me again, but this time negotiations were carried on until we finally arrived at a contract, and they were given the exclusive rights to build the machines in the United States, Canada and Mexico. 85

Q. I show you a letter from Mr. Maxfield dated October 29, 1935, and which is directed Transparent-Wrap Machine Corporation, Attention to Mr. Walter R. Zwoyer, and ask you whether that relates to their request that they be given some rights with respect to your invention? A. This is a letter in reference to conferences that we had. I do not know whether it is the first or second conference, which finally led up to the signing of the contract. 86

Mr. Adams: I offer it in evidence as Defendant's Exhibit C. I have given copies of most of these to Mr. Darby already.

The Court: What is the date of that?

Mr. Adams: That was October 29, 1935.

(Marked Defendant's Exhibit C.)

Mr. Darby: Could I clarify this one point, if the Court please. Am I correct in assuming, Mr. Adams, that you are proceeding under your counterclaim with this because on my complaint it is my position that the issue is the interpretation of the contract, and anything that transpired prior to the entering of the contract is irrelevant and immaterial unless it be, and even then the rule is limited—unless it be that there is ambiguity of the contract. 87

I can't conceive where this would be admissible except under your counterclaim.

Mr. Adams: Well, I would say I am not distinguishing in the evidence between the two. I think what I am putting in relates to both the counterclaim

88 *Zwoyer—Direct*

and to the plaintiff's claim. I think as a matter of fact, whether there is ambiguity or not, the evidence would be admissible—as it always is—to show the circumstances under which the contract was made.

Mr. Darby: Not if it is for the purpose of varying the terms of the agreement. If, as you say, you are drawing no distinction between the two, that satisfies me.

Mr. Adams: That is right.

89 Q. I also have a letter of November 15, 1935, from Mr. Maxfield, in which he apparently presses their request still further, and a letter from you to Mr. Maxfield, dated November 26, 1935, giving them an agreement for certain sales commissions. Will you identify those letters for me?

. . . . . .

A. I believe this is a letter in relation to the purchase of the augurs and sleeves used on the Transwrap machine that was furnished to Mexico City.

Q. "P.S." I call your attention to the reference to the Miller's Peanut Products Company, in which they say, "We would like to offer them one of your machines if it is agree-
90 able to you, and if so, would like to have you send us a proposition which we could forward to them, and if you agree to do so, you might allow us some commission in the event of a sale." A. That is right. I do not know whether I ever offered them a proposition on it or not.

Q. Well, I direct your attention to that letter of November 26, which refers to the letter of November 15th. A. (No answer.)

Mr. Adams: I offer this in evidence as Exhibits D and E.

(Marked Defendant's Exhibits D and E.)

Q. I show you a letter of February 10, 1936, from Mr. Maxfield of the Stokes & Smith Company to Mr. Zwoyer with an enclosed letter also dated February 10, 1936, from Mr. Maxfield, addressed to Henry Heide, Inc.—the same address—in which in the first paragraph of Mr. Maxfield's letter to you he states:

> "The writer has desired to place before your company in some formal way the suggestion that if and when you should plan to make other arrangements for the sale and manufacture of your machine that it would be discussed with us." 92

And more on the same subject. Will you identify those letters?

The Court: What is the relevancy of these letters?

Mr. Adams: What I want to show here, your Honor, is first, that the Transparent-Wrap Machine Corporation was in business making these machines. Secondly, that the Stokes & Smith Company not merely requested that they be given a license, but that they were most urgent—were most urgent and 93 particularly renewed the request that they be allowed to take over the manufacturing rights, and I think that is and has an important bearing on the relationship between the parties.

The Court: The fact that the Transparent-Wrap Machine Corporation was in business, I suppose that would be relevant, and I do not know that it is disputed, and incident to getting a contract, would that be an important feature of it?

Mr. Adams: I think it is for this reason: it appears from this correspondence that the Trans-

94 *Colloquy*

wrap Company was at first reluctant and then was finally persuaded because of the ability or the represented ability of the Stokes & Smith Company to make developments and improvements because of their so-called large research facilities, and I want to bring that out to show the importance of it in the business deal.

I can maybe shorten this up. I have a number of other letters all directed to the same subject.

The Court: I do not see the importance of it.

95 Mr. Adams: There is a letter of February 21, 1936, in which they ask the Henry Heide Company and Mr. Zwoyer to come over and examine their factory, and then a letter—

The Court: I would expect any two people to a contract to do it—I assume it is implied in the making of the contract that they do it with their eyes open, and that both of them want to do it. I do not regard any reluctance on the part of one earlier, or any extreme willingness by the other at any time as much of a factor in it. Why should it be?

96 Mr. Adams: I say there are two reasons. One that I have mentioned, and that is, I want to show that the Transwrap people relied on the Stokes & Smith people to develop the machine, to make improvements.

The Court: They are required to under the contract, aren't they?

Mr. Adams: Well, I do not know whether that is required or not in the language. What it says is that Stokes & Smith will use their best efforts to promote the sale, and if they make any improvements to inventions they will give Transwrap the opportunity to patent them.

Colloquy 97

The second is this: as I understand the plaintiff's position, it challenges the legality of the separate clause. I want to show that that is an essential part of the whole transaction.

The Court : That is all right. I will allow that. But how is their anxiety to make the contract relevant?

Mr. Adams: I think the decided cases in circumstances of this kind seem to make a point of that, that the company who wanted to get into the business came to the inventor and said "Now we can do 98
a job for you. You just let us into the business," and that the inventor and his associates then did rely on it—

The Court: I will make those two findings just from the contract without any evidence.

Mr. Adams: Well, it would seem to me that inasmuch as we can so easily support it, that I can offer the letters in support.

I agree with your Honor that that is the reasonable implication of the contract.

I have these letters of Febrary 21, 1936, from 99
Mr. Stokes to Mr. Heide, and reply dated February 25, 1936, from Mr. Zwoyer to Mr. Stokes, and letter of March 20, 1936, from Mr. Stokes to Mr. Heide, and letter of April 27, 1936, from Mr. Zwoyer to Mr. Stokes, and letter dated May 20, 1936, from Mr. Heide to Mr. Stokes, which I can group together with a letter and enclosure of February 10, 1936, all of which relate to this same transaction.

Maybe I can include some others and just offer it as one exhibit. As I said, I have already given copies of these to Mr. Darby. Then we have the letter of May 25, 1936, from Mr. Stokes to Mr. Heide, and a

100 letter of March 15, 1937. I think I am right about that one—no, it is May 25, 1937.

Those are the letters which I understand that the plaintiff has copies of and which he is familiar with and which related to the correspondence or—leading up to the entering into of the license agreement I would like to offer them as a group.

Mr. Darby: I object on two grounds. On the first ground they are wholly immaterial and irrelevant to any issue in the case. On their face they
101 appear to be negotiations leading up to the execution of the agreement.

The Court: I am inclined to sustain the objection. Do you want to mark it for identification?

Mr. Adams: Yes, I can mark it for identification, your Honor, and offer it again later.

(Marked Defendant's Exhibit F for Identification.)

By Mr. Adams.

Q. The actual license agreement was entered into as a
102 result of negotiations at about what time, Mr. Zwoyer? A. If I remember rightly, it was some time in 1937.

Mr. Darby: It speaks for itself. It appears right on the face of the agreement, the 23rd day of June, 1937.

Q. Were you personally present or engaged in the negotiations that led to the agreement? A. I was at every conference which took place with reference to the agreement.

Q. I notice that in clause 12 the following language appears:

103

"If the Licensee shall discover or invent an improvement which is applicable to the Transwrap Packaging Machine and suitable for use in connection therewith and applicable to the making and closing of the package, but not to the filling nor to the contents of the package, it shall submit the same to the Licensor, which may, at its option, apply for Letters Patent covering the same."

Will you tell us why the clause "but not to the filling nor to the contents of the package" was included?

104

Mr. Darby: I object to that, if the Court please, as irrelevant and immaterial and incompetent.

The Court: The agreement as to that paragraph, as I already stated, appears ambiguous to me. Whether it is so or not may be cleared up by other testimony, and I will admit this subject to your later motion to strike it out if it appears what I call an ambiguity is due to my own misapprehension.

Mr. Darby: Very well, your Honor. I also call your Honor's attention to the fact that this witness is not a witness that signed this document.

105

The Court: He is an officer of the company.

Mr. Darby: I repeat my objection to the incompetence of the witness to answer this specific question as to why it was employed—why that language was employed.

The Court: Were you then vice-president of the defendant?

The Witness: I was not vice-president at that time.

The Court: What were you?

106 *Zwoyer—Direct*

The Witness: I was a director of the company. I was a director of the company from the day it started.

The Court: I will take it.

Q. Proceed. A. The part of the phrase or paragraph relating to the filling of the package was not in the original agreement as it was drawn up. At Mr. Stokes' request this clause was put in there and definitely related to filling mechanisms which might be used in the Stokes & Smith business, and he felt that nothing of this type should
107 be covered so that he couldn't use it in the continuation of his other business.

In reference to the contents of the package, that was decided because none of us felt we had the right to attempt to take out a patent on the materials that went into it because none of us knew what might go in, or we had no right to attempt to patent any materials for any other manufacturer who purchased the Transwrap machine that was made.

Q. Now I show you an advertising leaflet.

The Court: Why would you want to put it in
108 then?

The Witness: It was at Mr. Stokes' insistence it was put in so that we couldn't in any way cover the filling mechanism.

The Court: Well, "content"?

The Witness: I do not know why the word "content" was left that way except the fact that we couldn't attempt to cover the contents which really didn't belong to us but to somebody else, the people who buy the machine.

In other words, we have no right to take out a patent on a package containing peanuts so as to be

able to sell the machine to one man and exclude somebody else, or to make that man pay a royalty because we have a package containing peanuts—if such a patent could be obtained.

The Court: What is that?

The Witness: We had no right to apply for a package containing peanuts or any ingredients which might exclude one peanut manufacturer from doing business while another man to whom we had sold the machine had a right to sell peanuts in the package—

110

By Mr. Adams.

Q. I call your attention to an advertising leaflet of the Stokes & Smith Company—I do not know the date of this—it is quite obviously after the license was granted because it illustrates the Transwrap machine, but it also illustrates other machines, and I would like to ask you whether it illustrates their filling machines? A. This does illustrate in four instances the augur filling device.

The Court: Supposing somebody invented a device, somebody connected with the plaintiff, for feeding peanuts into the machine; do you think that would mean nothing else but peanuts? 111

The Witness: No, not the contents. If they invented a device to fill the package, whether it was peanuts or whatever it might be, it would not have to do with the contents, only the mechanism with which the package was filled. They are two entirely different things.

By Mr. Adams.

Q. Well, had you finished identifying them? A. I identified the first four items on here as machines used to fill powders into containers of some type. The latter two ma-

chines I have never seen. However, I know that Stokes & Smith made both of them from conferences held.

Q. I also ask you whether the same leaflet illustrates the Transwrap packaging machine? A. The same leaflet illustrates the Transwrap Augur feed, and the Transwrap volumetric measuring attachment as well as a Transwrap machine with a counting plate.

Q. I notice on one of the pages, one of the inner pages, it illustrates a machine identified as the Model B machine, and it states in connection with it:

113 "Equipped with augur feed for powdered products." Will you tell us what part of that machine has to do with the augur feed? A. The upper section of the machine above the top plate is the part of the machine that is purely the augur feed.

Q. To me it looks like one or two funnels? A. Two funnels, with an augur in each one of them, feeding the two separate sides of the machine.

Q. When you say "augur" in each one of them, how does it function? A. It rotates in the direction forcing the powder or product down into the package and is oper-
114 ated by a cam which determines the number of revolutions the augur makes, thereby determining the amount of product that is dropped into the package.

Q. Is that the general type of mechanism that you were talking about before when you said you first got in touch with Stokes & Smith concerning the augur mechanism? A. That is right.

Q. And at that time did you purchase it from them? A. I purchased the parts necessary to construct a machine from the Stokes & Smith Company. In fact there were two machines on which I purchased those parts.

The Court: They already had a feeding device?

The Witness: They already had that feeding device. I only purchased parts of their feeding device. The necessary parts, to use them on my machine—those parts were not only made by Stokes & Smith but by several other people. However, I purchased them from the Stokes & Smith Company.

The Court: Do you understand in the phrase, "but not to the filling nor to the contents"—you understand the "filling" to be an active participle to describe it? 116

The Witness: If it were right it would be "filling mechanism" and that is what definitely was meant at the time the contract was made. "Filling mechanism" or means.

The Court: If it meant "filling" in the sense of contents, there wouldn't be such a clash there. "But not to the filling," but that wouldn't go because the word "nor" is there.

The Witness: The contents were considered entirely as a separate thing.

The Court: Your explanation as to the reason I do not understand. 117

The Witness: We didn't feel that we had the right to attempt to take a patent out on the contents of the package.

The Court: I would agree with that but I would think that everybody at the conference, including the lawyers, would agree with that.

The Witness: There are cases where they have done that, taken out a patent on the ingredients. I had to have the patents cancelled some time ago. It happened in Mexico where the party took out a patent along those lines. I had to have the patent can-

118 *Zwoyer—Direct*

celled. If I had left it stand it would have excluded me from placing a machine into Mexico. It was necessary for me to go down there and have the patent cancelled.

The Court: That actually happened?

The Witness: It happened actually.

Q. In this leaflet I also notice the picture of what appears to be part of the mechanism. It is entitled "Section of pocket feed machine showing hand wheel for adjusting pocket sizes." Will you tell me what that has
119 to do with the Transwrap packaging machine? A. That was an improvement by the Stokes & Smith Company making the pockets easily adjustable so we could vary the volume of the drop into a package. It was an improvement made by them to make it more easily adjustable. We had means of adjusting it, but by placing a hand wheel on there it made it a simpler proposition.

Q. Is the mechanism which is there illustrated of the same general nature which is covered by one of the three patents in the license agreement? A. It is definitely of the same nature except for the fact that the plate here
120 is a larger diameter than the one shown in the original patent application (indicating).

The Court: Have you got a copy of the Mexican patent?

The Witness: I think we have it around somewhere. It was on a handmade package. It is a patent on a handmade package as they were able to take out a patent down there. However, because of its weakness I was able to have it broken. In fact they attempted to stop other people from purchasing Transwrap machines or being placed in the position where they would have to pay a royalty because of

the fact that they had held such a patent. Therefore it was necessary for us to have the patent cancelled.

Q. Was this on the package or on the contents? A. It was—as I remember it, it was package and contents—it was a cellophane package and they went into quite a detail showing the powder they had in it, but not only powders, but they covered other items such as candy—described them in the patent.

Mr. Adams: Maybe I can throw a little light on this. It just occurred to me that we have a document that may help.

The Court: Do you want a recess now?

Mr. Adams: Yes, it would be agreeable with me. What I was looking for was a long list of products that Stokes & Smith Company sent to Transwrap that they were in the habit of filling with other filling machines, and I was just wondering whether it would throw some light on the matter of the contents. It did not occur to me, but I would like to find that letter before we adjourn.

The Court: 1,986,422 is the master patent?

The Witness: This is on the dispensing mechanism—this is the master patent, I am sorry.

Mr. Adams: I do not recall what letter this was attached to, but it came from Stokes & Smith and it lists several hundred things, and just glancing at it at random, they talk about golf balls, graphite, greeting cards. All contents of packages. I can easily conceive that the contents might be a thing that might be patented; maybe medicine, or flavoring extract or chewing gum.

The Court: Could you patent the package?

124 *Zwoyer—Direct*

Mr. Adams: I do not think you could patent it unless there was some cooperation between the substance and the nature of the package—you could patent the package and the contents.

The Court: That is why I can't understand it.

The Witness: There is a patent in Cuba owned by one of our customers on a package designed with a certain printed design on it. He owns the patent on that, to be used for the packaging of coffee. He has also been able to stop everybody in Cuba from
125 using the particular design because of the fact he has a patent on it—what we call a copyright down there is a patent.

Mr. Adams: I must say at the moment I do not conceive of any situation where you could patent the combination of package and contents. It depends on only, in my mind, whether there is cooperation between the two. I know they got a patent on an orange coated with a chemical.

Mr. Darby: It didn't fare very well.

Mr Adams: That is true. The Supreme Court
126 held it invalid because it was a patent on an orange instead of on a combination. Those things do happen, as I say. Mr. Zwoyer said Transwrap had nothing to do with it.

New York, November 9, 1945, 10:30 a.m.

Trial resumed.

WALTER R. ZWOYER, resumed the stand.

Mr. Adams: Before we proceed to ask Mr. Zwoyer any further questions, in view of your Honor's in-

terest in whether you could get a patent on a combination of a package and contents, I located one last night on a cheese package; it is patent 2,383,352, which was granted August 21, 1945, and two interesting things about it—one of them is in claim 10 for example where it claims:

> "A block of cheese enclosed in a rubber-hydrochloride film consisting of a single substantially rectangular sheet of material folded once on itself" etc.

128

That material is what I understand is known in the trade as Pliofilm—well known in the trade—also the patent points on page 2, first column, about line 68:

> "any of these heat sealing operations may be done by hand but of course are advantageously performed by suitable automatic apparatus."

I have no reason to offer the patent in evidence but would be glad to do so.

Mr. Darby: I think it would be well to put it in.

Mr. Adams: Very well, I would be glad to put it in.

129

The Court: Well, that is not what I had in mind. This is a package that was fit for cheese and not anything else.

Mr. Adams: You see, your Honor, the claim calls for the cheese and the package. I will agree that it is not an improved form of cheese—as to what your Honor is thinking, I suppose it is the ordinary variety of cheese.

Mr. Darby: You could also use the illustration that the Carbice case uses, which was a package with solid carbon dioxide.

130 *Colloquy*

Mr. Adams: Yes, that was a combination of a package and solid carbon dioxide. Also, I call your attention to the fact that in its circular that Stokes & Smith Company, to which the witness referred yesterday, and which I myself offer in evidence right now, so we can mark it; (Marked Defendant's Exhibit G) it is Defendant's Exhibit G, and there are illustrated a great variety of products enclosed in the package.

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131 T. 111

Mr. Adams: What I think is the natural reading of the first sentence of clause 12 is with certain ideas necessarily implied. It starts off and talks about "improvements applicable to the Transwrap packaging machine and suitable for use in connection therewith, and applicable to the making and closing of the package, but not"—and here the words "those applicable" are understood, "those applicable to the filling nor", again understood, "those applicable to the contents of the package".

132 Now that to me is the natural way to read it because of the punctuation, and because of the ideas. To me it certainly is consistent. To me it is the only one that fits the thought of the parties.

• • • • • • • • • • •

T. 115

The Court: You do not dispute that those words have to go in, do you? You have to introduce something to make it a phrase. If you take the particular language it would raise no meaning at all.

Mr. Darby: I think that would be a fair interpretation. That I do, your Honor.

• • • • • • • • • • •

T. 118

By Mr. Adams:

Q. I will show Mr. Zwoyer this strip of packages containing, apparently, licorice drops, and I will ask you whether that was made on one of the Transwrap packaging machines? A. It definitely was made on the Transwrap packaging machine. 134

Q. I notice that these packages, a series of six of them, are all fastened together in a continuous strip. Is that the normal operation of the machine, to leave the packages that way? A. No, that is not the normal operation of the machine. The last operation on the machine severs the packages halfway between the length of the seal.

Q. The cut is made through the t· ·verse sealing part? A. Yes.

Mr. Adams: I offer in evi· ·e the strip of packages filled with confection made on the Transwrap machine. 135

(Marked Defendant's Exhibit H.) (Physical Exhibit.)

Q. Now I show you another strip with no contents. Will you tell us what that is? A. This is a strip made on the same machine by merely shutting off the feeding device and not allowing any material to deposit in the packages.

Q. Will you point out whether or not these packages are individually or completely sealed? A. These packages are completely sealed individually as the machine operates.

136 *Zwoyer—Direct*

Q. That is the normal automatic operation? A. Yes.

Mr. Adams: I offer that in evidence as Defendant's Exhibit I.

(Marked Defendant's Exhibit I.) (Physical Exhibit.)

* * * * * * * * * * *

Now, before I take up the individual patents in dispute, I would like to cover one minor matter. I notice in the circular of the Stokes & Smith Company,
137 that is in evidence as Defendant's Exhibit G, they advertise the machine under the name Transwrap.

Q. I assume that they do this by some arrangement with your company, is that right? A. Yes, we granted permission to use the trademark of the registered name Transwrap.

Q. I show you letter of July 2, 1937, from Stokes & Smith, requesting this privilege, and your reply of July 8th, 1937, granting it? A. These are the letters in which the matter of their right to use the name Transwrap—

138 Mr. Adams: I offer the letters in evidence as Defendant's Exhibit J.

Mr. Darby: There is no dispute about that. The witness has testified it is the fact. We do not dispute it.

Mr. Adams: It is a fact; then maybe we can stipulate the rest of the facts. This says "This authorization is to be valid during the tenure of our agreement relating to the manufacture and sale of Transwrap packaging machines."

Mr. Darby: We do not dispute that either.

Mr. Adams: Then we do not need the letters.

139

Q. Now, Mr. Zwoyer, will you direct your attention to the patents which are set forth in the counterclaim as patents which you claim should be assigned by Stokes & Smith to Transwrap Company. The first one I call your attention to is 2,145,941, and will you explain to the Court what that shows?

Mr. Adams: I may say, your Honor, that this is one of the patents which we do not now assert any claim to, but I would like to have the explanation of what the invention is as he understands it.

140

A. This patent does disclose a method of filling the container with a gas, and a vacuum pump to draw out the air that might be in the package before the gas is introduced. It has a former similar to the original and an end sealing device similar to the original, and also a severing device similar to the original Transwrap package.

Q. Does it show a mechanism for feeding in—feeding the gas into the package? A. It shows the tube through which the gas can be introduced, and the tube through which air can be evacuated from the package, as well as a chamber around the material tube or filling tube through which the gas can be introduced and the air can be evacuated.

141

Q. Is this chamber around the filling tube shown in Fig. 7? A. It is shown in Fig. 7, that is right.

Q. In the improvement which is there shown, I would like to have you comment on the actual steps that are taken with respect to evacuating the package and filling it with gas? A. The film is drawn around a former and drawn forward with the end-seal dies. The moment the end-seal dies are closed, the vacuum pump is started to draw out the air in the package and allow the gas to enter on the other side. The package is then brought forward and severed after being completely sealed on both ends.

142 *Zwoyer—Direct*

Q. What is the idea of introducing gas as one of the contents of the package? A. The idea of introducing gas as one of the contents of the package is merely the preservative for ingredients that might be placed in the package, such as milk powders and certain materials which deteriorate unless they are so protected.

Q. I direct your attention to Patent 2,146,308. I think I could take these in the order in which they appear in plaintiff's binder. And will you explain to us what the improvement is in that patent. A. The improvement in this
143 patent is merely a method of forming a package. It does not disclose any method of filling that package. Instead of overlapping the seam the seams are brought together.

Q. You say instead of overlapping. A. Instead of overlapping as done in the original package—overlapping and sealing—the two edges of the film are brought together and sealed between an additional film to give it a greater mechanical strength, also allowing the possibility of perforating it so it can be hung on a rack.

Q. Does this figure 1 show a former? A. It shows a former which is necessary to form a tube—to take a flat
144 strip of film and form it into a round tube.

Q. Does it differ from the specific former in your own? A. No, it does not differ from the specific former in our own, because there is only one way of making that former.

Q. What produces the difference between the overlapping seal on your package and the edge seal of this package? A. Merely a guide strip that is placed in front of the former—merely elimination of the guide strips, causing it to overlap. In this case the guiding strips are eliminated.

Q. Does this include a heat sealing mechanism? A. Item 2 is a heat sealing mechanism which seals the ends of the package as well as providing a means of drawing forward the film.

145

Q. Is there a cutting device? A. The cutting device which is item No. 4, which follows in operation the sealing and drawing forward of the package.

Q. I direct your attention to Patent 2,146,831. Will you similarly comment on the invention of that? A. This patent also does not disclose any method of filling the package but is a method of forming the end of the package so the ends can be turned over and sealed back upon themselves. It also discloses the same method being used on the sealing of the seams of the package (indicating), although this edge can be turned over and sealed back upon itself.

146

Q. I now direct your attention to Patent 2,154,521. A. This patent is—it discloses a method of introducing a liquid into the package as well as a method of using a multiple series of films in making what is known to the trade as a double wall package.

Q. I notice in Fig. 4 there appear to be two formers and two rolls of film. Would they both be attached at some appropriate point to your Transwrap machine? A. Yes, they can be both attached and both used on the Transwrap machine as set up now.

Q. Do you understand that this improvement is directed to the filling device or to the package and the method of making it? A. As I understand it here, it is directed to the making of the package, although it does show a means or a container in which a liquid can be held above the filling tube.

147

Q. I now direct your attention to—

Mr. Darby: Before you proceed, Mr. Adams, if your Honor please, to preserve my position on the record, may I move to strike the witness's last answer because he has not been qualified as a patent expert to construe the claims.

148 *Zwoyer—Direct*

The Court: Overruled.

Mr. Darby: May that objection run throughout the testimony of the witness so I won't have to interrupt?

The Court: What is your objection?

Mr. Darby: That the witness has not been qualified as a competent expert to construe patent claims. I think in the final analysis the construction of the claims are up to the court in any event.

The Court: Overruled.

149 Mr. Darby: May my objection run throughout the testimony so I need not interrupt again?

The Court: Yes.

Q. I call your attention to Patent 2,160,367, and ask you to continue on the disclosure of that patent. A. This patent also does not disclose any method of filling a package except that it allows the removal of air and introducing gas. The mechanical construction is similar to that used on the Transwrap machine in forming and filling—I mean in forming and drawing forward a strip of film making the package. However, they do have a method of introducing gas into the 150 package either with the contents or after the contents are placed in the package.

Q. Will you point out in the drawings where that mechanism is shown? A. It is shown on Fig. 3 as item No. 1, and shows on Fig. 9 as 10 and 12, being the openings in the tube in which the gas might be emitted or the air might be removed. It is shown on Fig. 11, as 10 and 12, where gas might be introduced and air quickly removed.

Q. I notice for example in Fig. 11 as well as Fig. 9, there seem to be three apertures in the tube. Will you tell us what the apertures are for? A. Aperture number 10 is the port through which the gas can be introduced. Opening

number 8 is the aperture through which the ingredients placed in the package would be introduced, and opening number 12 is the place through which the air would be removed.

Mr. Adams: I may say also that is the second one of the patents which defendant does not claim, or as to which it relinquishes its claim.

Q. I now direct your attention to Patent 2,199,708, and ask you what that patent is directed to? A. This patent is directed to the locating of a printed spot or printed surface in its proper relation on the package being made. 152

Q. Well, what does that have to do with the making of the package? A. It has nothing directly to do with the making of the package except to the fact of registering the printed surface in its proper position on the package.

Q. Why is that important in making the package? A. It is important from the standpoint of the customer in having his product properly identified and giving a package to him that is properly presentable.

Q. Well, for illustration, let me show you the packages in Defendants' Exhibit H. Does that have designs on that package? Did that present that sort of problem? A. Yes, 153 it presents identically the same problem.

Q. What is the objective there? A. To register the printing in its proper position on the package.

Q. I do not think you commented, but does this patent show any filling device? A. This package shows a filling device similar to the original Zwoyer patent, being a volumetric filling device.

Q. I now direct your attention to Patent No. 2,200,971, and ask you to comment on that patent. A. This patent is a patent of producing a package of the—of using a material of a little different nature than cellophane. A film that has to be held—a material which makes it necessary to keep

154 *Zwoyer—Direct*

the ingredients that are dropped into the package away from the heating dies until they have had an opportunity to set, and also provides a means whereby the Pliofilm is not sealed at the point where the packages are severed.

Q. How is this last accomplished? A. This last is accomplished by an opening in the die allowing a space on the film which is not affected by the heat as Pliofilm when heated remains soft for a considerable length of time after heating and does not carbonize the same as cellophane.

Q. Can you point to one of the figures that shows this
155 die? A. Fig. 13 is a description of this die with the opening, to which an arrow points number 150 describing the opening of this die.

Q. Does this patent show a filling device? A. This patent shows the volumetric filling device somewhat similar to that used on the original Zwoyer patent.

Q. Where, for example, is that shown? A. That filling device is shown as H on Fig. 2.

Q. While we are at it, I will go back for a moment to the previous patent, 2,199,708, and ask you to show where that filling device is shown there? A. It is illustrated in
156 Fig. 6 as a combination of number 36 and number 37, and also 14.

Q. Now look at Patent 2,257,433, and I would like to have you comment on the disclosure of that patent?

The Court: What number is this in Mr. Darby's book?

Mr. Darby: That is No. 8, your Honor.

A. This patent does not disclose a filling device but a method of producing a package from a film, to eliminate wrinkles which are formed when drawing the film over a former. This is done by severing the film before it passes down through a funnel which causes it to form into a tube.

Q. When you say severing it, what actually happens? A. Severing the film partway across the width to allow it to form into a tube without the need of a specific former which causes the film to be formed into a tube and causes all parts to hold under equal tension.

Q. Can you show us in Fig. 1 these slits or cuts in the film that you are talking about? A. In Fig. 1 the S is the slit that is put into the film before it is drawn down into the funnel required to form it into a tube.

Q. I now direct your attention to Patent No. 2,257,823 and ask you to comment on that patent? A. This is a pat- 158
ent on a method of making a tube whereby a strip of material can be inserted into the package helping to reinforce the package. It—

Q. Will you show us in Fig. 1 where this reinforcing material is? A. This reinforcing material is in Fig. 1. This reinforcing material is shown as figure L, just before passing into the former.

Q. Where does that material appear in the final package? A. It appears as a coating inside the final package to make the package more moisture proof.

Q. Does this show any method of filling? A. No, this 159
shows no method of filling.

Q. I now direct your attention to Patent 2,259,866, and ask you to comment on that? A. This patent does not disclose a method of filling but is a method by which certain portions of the package are reinforced, namely, the four corners and the strips of material are shown as X and T in Fig. 1.

Q. I now similarly direct your attention to Patent 2,260,064, and ask you to comment on that? A. This patent does not disclose a method of filling the package but again discloses a method of reinforcing the four corners of the package. The package was made similar to those made on

160 the original Zwoyer patent with the exception of additional films being fed in at the same time as the package forming film.

Q. I now call your attention to Patent 2,294,215, and ask you what that patent is directed to?

The Court: In all of these except 1 and 5 so far —are they suitable for use in connection with the Transwrap machine?

The Witness: They are all suitable in use for
161 the Transwrap machine.

A. This patent again does not disclose any means of filling the package but it is a method of forming what is known as a gusset type of package where the two sides of the package are folded within the package and sealed in that position.

Q. Does this patent disclose any filling device? A. This patent discloses a volumetric filling device similar to that as described on the original Transwrap machine.

Q. Where is that for example in Fig. 2? A. That is shown in Fig. 2, as a combination of items 42, 39, and 43.

162 Q. I now call your attention to Patent 2,294,220, and ask you to comment on that? A. This patent does not disclose any feeding device but is a method of reinforcing the end seal on a package which might be used to contain a liquid.

Q. Is it true of these last two patents that you just talked about that they disclose improvements suitable for use on the Transwrap machine? A. They are all improvements suitable for use on the Transwrap machine.

Mr. Adams: The final patent, your Honor, is 2,330,015, and that on its face states that it is a divi-

sion of another one of the Stokes patents on which the witness has already commented, namely, 2,260,064. 163

The patent on its face says it is for a container, and the claims are directed to the container. The disclosure drawings and the description can be identified as being practically identical with the patent of which it is a division, but this is the final one, the third of three, to which the defendant relinquishes the claim asserted in the counterclaim. That is because it relates to the container as such. I will say this, your Honor, that I think this particularly is the 164 type of patent which the defendant might very well say it should own. As you can see, it is a division of a patent which relates to the method of making the container. It just happens that the rules of the Patent Office have required some claims to be in a separate patent on the container. It is very easy to see that this might be used by Stokes & Smith to keep Transwrap from enjoying this other patent in the sense that if Transwrap ever made containers, under the patent showing the apparatus for making, and the method of making the containers, when they 165 got on the market might be stopped by this. I do not think we have to go to that doctrine which is really a doctrine of fiduciary relationship between the parties, and rather than get into that with respect to this patent we relinquish our claims with respect to it.

The reason I make this explanation is I do not want to set a precedent for any other inventions that may come along that are made by Stokes & Smith.

(Short recess.)

Mr. Adams: Before I forget it, your Honor, due to the fact that Mr. Darby would like to have me do

166 *Zwoyer—Direct*

so, I will offer in evidence this patent on the cheese package, 2,383,352.

Mr. Darby: No objection.

(Marked Defendant's Exhibit J.) (Physical exhibit.)

Q. I notice, Mr. Zwoyer, that these patents concerning which you have just testified, covered a period from approximately the fall of 1937 to the fall of 1943. I believe the earliest of the patents is filed in the fall of 1937, and the
167 latest one issued in the fall of 1943. During this period was your company cooperating closely with Stokes & Smith in promoting the business? A. We were always cooperating very closely.

Q. Were they cooperating with you? A. They were cooperating with us.

Q. Did the business appear to be progressing? A. The business appeared to and is progressing.

Q. I take it the future looked good? A. It looks very good.

Q. Did then? A. Yes, that is right; it did then.

Q. Had you at that time any reason to believe that they
168 would not continue in the business? A. I had no reason at that time or any time to think they did not want to continue in the business.

Q. Now, during that period of time did Stokes & Smith ever advise your company that any of the inventions of the eleven patents now claimed by your company, were completed and ready for patent application so they could elect whether or not to patent them? A. We were never notified at any time by Stokes & Smith that any patents were ready for application.

Q. Did Stokes & Smith at any time after they had secured any of these patents advise you that they had secured

the patents? In that connection I call your attention to the letter from Stokes & Smith dated September 17, 1942. A. They never advised us at any time that they had taken out or ever received a patent on an improvement on the Transwrap machine. This letter that you just showed me is a letter referring to a patent obtained by a Mr. Waters in reference to an open-mouth bag, and in it Mr. Maxfield refers to a patent obtained by him but does not state that it is a patent obtained as an improvement on the Transwrap machine.

170 Mr. Adams: That patent, your Honor, is No. 2,154,521, which is one of the ones to which the witness has just testified. I do not have the original of this letter but I would like to offer the copy in evidence if the plaintiff has no objection.

. . . . . .

(Marked Defendant's Exhibit K.)

Q. Now, on February 27th, 1939, the Stokes & Smith Company I believe sent your company a letter. I have a copy of such letter here and would like to have you identify it. Was that sent to and received by your company at 171 about that time? A. That was sent to and received by our company at about that time.

Q. Does that letter ask for royalty reductions? A. It is a letter regarding royalty reductions.

Q. Does it talk about research and developments? A. It does.

Q. Does it talk about inventions? A. It talks about the possibility of—

Mr. Darby: I object. The letter speaks for itself.

Mr. Adams: I offer the letter in evidence, your Honor.

172 *Zwoyer—Direct*

Mr. Darby: No objection.

(Marked Defendant's Exhibit L.)

. . . . . .

Q. Did Stokes & Smith in connection with that letter or the request for royalty reductions stated therein, inform you that they had made any of the inventions which you referred to this morning in these eleven patents? A. They did not in that letter or any other letter.

Q. Or orally? A. Or orally.

173 . . . . . .

Q. Now I notice in the notice of default that your company sent to Stokes & Smith January 22, 1944, which is Plaintiff's Exhibit 2, the notice lists only four patents which were cited during the course of prosecution of your application for a patent on the Fin-Seal machine, and it demands knowledge as to others, other patents that may have been taken out or inventions made by Stokes & Smith.

Now it has been stated here by the plaintiff that your own patent attorney made weekly examinations of the Patent Office Gazette and that you were thus informed as to
174 the Stokes & Smith patents. Did your attorney in fact make weekly examinations of the Patent Office Gazette to locate patents of this nature?

Mr. Darby: I do not think this witness is competent to answer that.

The Court: Do you know?

Q. Do you know whether they did or not? A. Yes, they did make weekly examinations.

Q. What did they relate to? A. They related to any patent that might have been issued which in any way might be considered an infringement on the Transwrap machine.

175

Q. Now, as a result of these weekly examinations did they send you patents from time to time? A. They sent us patents of all kinds but I don't remember just whose patents they were. I couldn't begin to tell you.

Q. Specifically, as a result of these weekly examinations did they advise you that any of the eleven patents that we are now talking about had been issued to Stokes & Smith? A. That I don't remember.

Q. Well, do you know whether they did or not? A. They might have. I can't state whether they actually did or not. They might have. Possibly they did.

176

Mr. Adams: Well, now, I may state for the record, your Honor, inasmuch as we are here in the situation where we are trying to examine into this matter fully, that in the course of my preparation of this case for trial I got some carbon copies of letters in which apparently the patent attorney for Transwrap had directed to Transwrap's attention and that mentioned the first seven of the patents that have been discussed. The first seven of the fourteen. And I would like to state that fact and have it noted on the record.

177

Now let me proceed to the next point.

Q. After you sent this notice of default to Stokes & Smith of January 22, 1944, what was their reply? What was the reply of Stokes & Smith to your notice of default?

Mr. Darby: May the letter speak for itself?

Mr. Adams: All right; I have a letter dated January 26, 1944, from Stokes & Smith to Transparent-Wrap.

Q. And ask you that you identify it. A. This is a letter from Mr. Stokes to Mr. Heide, suggesting that—

178 *Zwoyer—Direct*

Mr. Darby: I object.

Mr. Adams: That is not what I asked you.

Q. Will you identify that? A. I identify the letter from Mr. Stokes to Mr. Heide.

Mr. Adams: I offer it in evidence as Defendant's Exhibit M.

(Marked Defendant's Exhibit M.)

Mr. Adams: Now I call your Honor's attention
179 at this point for continuity to this letter which states:

"We are in receipt of your notice of January 22nd and recognize that there are quite a number of patents which should have been assigned to your company. We are getting a complete list and copies of the patents for your full information."

They go on and discuss other related matters and suggest a conference to try to iron out the whole thing, and in the course of it they mention that a
180 conference had been projected but it never materialized. So he goes on to say:

"So perhaps both of us have been rather lax in some of these details, but we feel no real harm has been done. Under changing conditions there are several points which should have our attention, and I hope you will be willing to have the conference after we have been able to get our patent copies and assignments prepared for you."

Your Honor will recall that it was thereafter that the Transwrap Company sent the notice setting the

date of termination because Stokes & Smith had not in the interim remedied the default.

That notice has been introduced in evidence I believe as Plaintiff's Exhibit 4. What is the date of that? April 29th, I understand.

I have a letter dated May 2, 1944, from Stokes & Smith Company to Transwrap, stating that it is in answer to the letter of April 29th as well as the letter of April 17th, and it attaches an opinion dated May 1, 1944, of Mr. Charles Howson, of the firm of Howson & Howson. 182

Q. Can you identify that letter as having been received by your company, Mr. Zwoyer? A. Yes, sir, I identify this letter as a letter having been received.

Q. With the attachment? A. Yes, with the attachment.

Mr. Adams: I offer it in evidence as Defendant's Exhibit N.

(Marked Defendant's Exhibit N.)

Q. May I ask you one thing about this matter that we touched on before, before I forget it. Your patent attorney at that time, what was his name? A. Mr. Giles. 183

Q. Is he now dead? A. He is not dead but he is not operating.

Q. He is incapacitated? A. Yes, he is incapacitated.

* * * * * * * * * * *

Tr. 141.

Mr. Adams: Here is another matter I might put in evidence. I previously mentioned the fact that these Zwoyer patents, the three of them, consisted of original patents and two divisions, and that the divisions were filed as a result of a requirement by

184 *Colloquy*

the Patent Office. Mr. Darby did not want to stipulate that so I would like to offer in evidence the actual requirement of the Patent Office that they be divided. Any objection?

Mr. Darby: No objection. I did not stipulate it because I did not know it to be the fact.

Mr. Adams: Then we do not have to put this in, if you can stipulate it.

The Court: Well, it is in already.

(Marked Defendant's Exhibit O.)

185 Mr. Adams: Also, with reference to, I believe it was, Exhibit F, which was marked for identification—I have on examination limited that down to two letters. The letters, both of them from Stokes & Smith to Transwrap, and one of them dated May 25, 1936, and the other, an earlier letter, dated March 20, 1936, both of them expressing the fact that Stokes & Smith was in a position to develop inventions which would be to the advantage of the Transwrap machine.

186 Both of those letters were written prior to the making of the license contract in question, and I would like to offer them in evidence.

Mr. Darby: I object to that. I renew my objection to the prior offer. They are prior to the date of the contract. They are negotiations leading up to the making of the contract and they are irrelevant and immaterial to the case.

The Court: I think they are irrelevant.

Mr. Adams: Their importance resides in this: that they do two things. One, they point out the community of interest here. They are letters from Stokes & Smith emphasizing what they can do for

the two companies. They furthermore point out the importance of research and development of the matter.

Mr. Darby has challenged the propriety of transferring certain patents. I say an important factor in that is a matter of human dealings, and under the decided cases, is the real relationship between the parties; whether there was a community of interest there; whether they were really supposed to be acting in the interest of the business which was a business they were both interested in. 188

The Court: I will exclude them.

Mr. Adams: There is one further point, that is, that Mr. Darby has challenged clause 11 and clause 12 as such, separating them out from the rest of the agreement. What I propose to show is that they are an essential part of the deal between the parties, and these letters confirm that.

The Court: What was that again?

Mr. Adams: I say Mr. Darby's essential case is the challenge to the validity of two separate clauses of the agreement. To make good on that he has to 189 say, and I suppose he has said, that those clauses are invalid. I want to show they are an integral part of the deal, or essential part of the deal between the parties.

The Court: That wouldn't change the invalidity if they were invalid.

Mr. Adams: No, it would invalidate the whole agreement.

The Court: All right, I will allow it.

Mr. Darby: Will you hear me, if the Court please.

The Court: Yes.

190 *Colloquy*

Mr. Darby: Our position with respect to claim—to paragraphs 11 and 12 are that they are invalid or unenforcible. I do not care whether they are taken alone or with the entire agreement. Let us assume they are taken with the entire agreement. Your Honor has ruled that paragraph 12 is ambiguous and has allowed oral testimony concerning its construction. There is no other part of the agreement which has any dispute between us.

This correspondence has to do with negotiations
191 leading up to the nature of the agreement. When that agreement was entered into what transpired prior to that time has no effect upon your Honor's interpretation of the ambiguous terms. That is not one of the factors that the Court takes into consideration in resolving the ambiguity of disputed agreements.

The Court: I will allow that. When I said that Section 12 was ambiguous, I said it might be ambiguous to me as a layman, and I was taking it subject to a motion to strike it out if it—what I meant
192 was it is ambiguous in that the two of you do not agree on it.

I say as far as we have gone it would appear to me that its ambiguity is established inasmuch as the two of you do not agree on its meaning. I originally said I was taking the evidence because I was not clear and I was not certain as to its ambiguity, but I think its ambiguity has been established by you two lawyers.

Mr. Darby: I can understand that, but that doesn't make it admissible—correspondence that has to do with establishing what I frankly told the Court

was the fact in my opening statement. We approached Transwrap for this arrangement, and I do not think that correspondence leading up to a written document—there is nothing said in those letters—I have read them—that has any bearing whatever. I ask your Honor to read them, to see if that has any bearing on the question of ambiguity or the ambiguous language in the agreement.

The Court: It is not a question of ambiguity but it is a question of there may have been; in answer to your statement that the other two paragraphs are 194 illegal. I will take that.

Mr. Adams: I have limited it to two letters.

(Defendant's Exhibit F for Identification, now F in evidence.)

By Mr. Adams.

Q. Now, reference was made previously, Mr. Zwoyer, to the fact that you participated in the negotiations of the actual agreement. Will you tell what actual capacity you were acting in? A. I acted as representative of the Transparent-Wrap Machine Corporation in guiding the lawyers 195 of both parties, in preparing an agreement which would be acceptable to both Stokes & Smith and the Henry Heide—I mean Transparent.

Q. Were you in full charge of negotiations? A. I was in full charge of negotiations at that time.

Q. Let me ask you whether the fact that Stokes & Smith represented that it was in a position to make developments of the Transwrap machine and inventions relating to that was an essential factor in making the deal with Stokes & Smith? A. It was definitely a factor in making the deal. Mr. Stokes had made it very clear to us, and took us through

196 *Zwoyer—Direct*

his factory and showed us various pieces of equipment on which he was spending a lot of money developing, and showing he had a department in which he could develop the Transwrap machine and improve whatever parts might require improving.

Q. Were these provisions relating to Transwrap improvements or the inclusion of the improvements in the license which are covered by clauses 11 and 12; were they essential parts of the deal? A. They were definitely essential parts of the deal.

197 Mr. Adams: That is all I have, your Honor.

I may note for the record at this point—it may have no importance—but Mr. Darby mentioned in the notice of default of January 22, 1944, the Transparent-Wrap Corporation included a patent which it doesn't now claim at all. Now the patent actually that is there given by number I checked up and it is for a railroad air hose coupling. It is quite obviously a typist's error. I put the numbers down and the patent should have as its last two numbers "71" instead of "67", as I recall it.

198 The Court: The witness's qualifications have been questioned on his capacity as an expert. I think he has considerable mechanical knowledge but perhaps you had better ask him now.

By Mr. Adams.

Q. Have you made other inventions than the patents which are here in suit—other than the three patents which are here in the license? A. I made other inventions although we have not been able to obtain patents on all of them. We have applications in at the present time approximately for ten other inventions.

199

Q. Have you worked with your attorneys in the prosecution of those applications? A. I have.

Q. Over what period of time have you done that sort of thing? A. Over the period of approximately the past ten years.

Q. Has that work included work on the description of the devices in the specification? A. On the description of the devices and on the rewriting of claims.

The Court: Are you a professional man?

The Witness: Self-made, sir.

200

Q. What is your profession? A. I am a mechanical engineer.

Q. What was your employment before you worked with the Heide Company? A. I was superintendent of the Westinghouse Electric Elevator Company. I was in charge of research—part of the research for the Otis Elevator Company. I was superintendent of production of two plants producing the elevator accessories used by both Otis and Westinghouse, and I was factory superintendent for the DeForest Radio Company.

201

Q. Tell us something of your familiarity with the package machinery business? A. Previous to the time I came with the Henry Heide Company I knew nothing about packaging machinery. But I have been—I have spent quite some time, practically 70 per cent of my time with the—since I have been with the Henry Heide Company, on producing and aiding in the development of certain packaging machinery as well as a considerable amount of candy making machinery.

Mr. Adams: That is all.

Cross examination by Mr. Darby.

Q. You referred to the fact in your qualifications that you had some ten applications. You referred in connection with your qualifications that you had on file or had made application for approximately ten patents in the last ten years; is that right? A. Yes.

Q. Did any of them have to do with the Transwrap Machine? A. Two of them.

Q. And did they issue as patents? A. One of them did
203 and the other is still in litigation.

Q. Do you mean in litigation in the prosecution of the Patent Office? A. Yes.

Q. And that one that is still in prosecution at the Patent Office, when was that applied for? A. Approximately a year and a half ago; maybe two years ago it is. I am not exactly familiar with the date. It had reference to a package which I developed for the Quartermaster's Department in which we packaged all the beverage components which were used in the emergency package; there were about twelve million packages made on the Transwrap machine.

Q. Was that invention ever called to the attention of
204 Stokes & Smith? A. Oh, yes, definitely so.

Q. Then as I understand it, since the date of this agreement between the plaintiff and the defendant only two patent applications have been filed relating to the Transwrap machine by you or by the Transwrap company? A. Only two patents have been filed in this country.

Q. In this country? A. Yes.

Q. Under the agreement your company reserves all rights other than in the United States, Canada and Mexico, I believe, is that right? A. Yes.

Q. Were the applications for patents filed in other countries other than the United States during that period of time? A. Yes.

Q. Were they based on the inventions of one or more of the three Zwoyer patents? A. They were all based on the original Zwoyer patents. 205

Q. So the applications in the foreign countries only had to do with Zwoyer patents in the foreign countries on the same patents you had in the United States? A. Yes.

Q. The Court asked you a question in connection with your review of the patents which have been called in issue in this case, and it is a fact, is it not, that all three of the patents which are identified as tabs 1, 5 and 14, and which are the three patents as to which the position of the defendant now is, it is not at issue in this case—it is true as to each one of those three, that they are applicable to the Transwrap machine? A. Yes. 206

Q. All three of them? A. Yes.

Q. And that same statement is true with respect to the remainder of the patents? A. That is right. All except the one which is purely a patent on the bag. While that can be made on the Transwrap machine—

Q. It can be made? A. Yes, with modifications.

Mr. Darby: I offer in evidence letter dated July 28, 1937, from Stokes & Smith, Mr. Maxfield, to Transparent Wrap Machine Corporation. It is offered under stipulation. 207

(Marked Plaintiff's Exhibit 6.)

Mr. Darby: May I read this to your Honor?

The Court: If it is long, I will read it.

Q. First let me ask, who is Mr. Maxfield? A. Mr. Maxfield, as I understand it, was sales engineer for the Stokes & Smith Company.

Q. And you had frequent contact with him after the agreement was entered into in getting the Stokes & Smith Company going? A. I did, yes.

208 Q. This letter is to Transparent-Wrap Machine Corporation, and reads:

"The writer has recently reviewed a number of the Ivers-Lee patents and it is very evident that by means of method patents they have endeavored to fortify for themselves the use of various forms of package, consisting of two or more separate leaves of plastic covering and other materials.

"In a similar way we think we should endeavor to further fortify the use of a package such as is made 209 on the Transwrap packaging machine, and we suggest that either you or we, or both in cooperation with each other, should apply for some method patents covering various forms of package as might be made on the Transwrap packaging machine.

"All of these would be based on a tubular structure formed by a single web of material and sealed at both ends either by pressure or heat, or both, and sealed along the longitudinal seam either by pressure or both, and might have any one of the following variations:

210 "1. A package formed from a web of paper or other fabric or sheet material on which has been imprinted at the points to be sealed a plastic coating. Thus by this method a package may be made of kraft paper in the Transwrap packaging machine.

"2. In order to strengthen the"—

You are familiar with this letter, are you not? A. Yes.

Q. Without taking the time to read all five of the suggestions—I am referring to this again—did you or your company apply for any patents on the subject matters submitted that Mr. Maxfield suggested in this letter? A. We

did not apply for them but Mr. Maxfield and I both discussed the possibility of applying for such a patent, and we never came to any agreement or attempted to come to an agreement as to whether or not it was really worth while doing.

Q. But you know from your review of the patents that have been in evidence here that Maxfield—that Stokes & Smith did proceed to apply for a patent on some of these items, do you know that? A. I do not know that they definitely did.

Q. I call your attention for example to Maxfield Patent 212
2,154,521, which is tab 4 in the book of patents. Does not that patent disclose the subject matter you find in the suggestion of Mr. Maxfield? A. No, it does not.

Q. All right. Do you recall any of these patents disclosing subject matter disclosed by Mr. Maxfield in this letter? A. The first two paragraphs in this letter, where he refers to imprinting and sealed plastic coating. I do not know whether there was ever a patent issued on that. There have been patents on which reinforcing material was added.

Q. Go to the third paragraph of paragraph numbered 1? A. What is that? 213

Q. The third paragraph of the letter in paragraph 1. Is what Mr. Maxfield suggested—I do not want to limit you to one—you can read all five. My question is, can you tell me whether or not any of the patents that are in evidence in this book of patents disclose the subject matter which was communicated to you by Mr. Maxfield in that letter? A. Well, this letter is a general letter and may cover a whole lot of things.

Q. Can you answer my question? A. There is nothing specific in this letter, stating that a certain patent should be applied for.

214 *Zwoyer—Cross.*

Q. Can you answer my question? A. Will you repeat it?

(Record read.)

Mr. Adams: I think Mr. Darby ought to clarify what he means by "disclose the subject matter".

Mr. Darby: The witness has not raised any question about his inability to understand the question.

A. I think I have disclosed that very thing in the evidence, that this letter is a general letter and does not point out
215 any particular thing that should be patented and therefore I am in a quandary just how to answer your question.

Q. Very well. The third paragraph of the letter refers to "a tubular package structure formed from a single web of material and sealed at both ends either by pressure or heat, or both, and sealed along the longitudinal seams either by heat or pressure or both." Do any of the patents disclose—in the exhibit book—of the patents of Stokes & Smith show that or describe it?

Mr. Adams: May I interrupt, your Honor? I object on the ground that that is not the issue and
216 is not material to the issue. It is well known that patents will disclose many things which are incidental to the invention.

The Court: I will allow it.

A. This third paragraph is absolutely a description of the original Zwoyer patent owned by the Transparent-Wrap Corporation.

Q. You understand my question. That is not what I asked you? A. Yes.

Q. Will you answer it, please? A. Some of these patents do perform the very things suggested in this letter.

Mr. Darby: Thank you.

Q. Now, will you tell me whether or not some of these patents of Stokes & Smith show or describe, or both show and describe, a tubular type of package on which has been imprinted at a point to be sealed, a plastic coating? A. I don't remember any— 217

Mr. Adams: I think I ought to renew my objection. The thing Mr. Darby is apparently driving at is whether it discloses or describes something. The important thing is what is the improvement, not what the patent happens to have in it, but what was the improvement. As was previously brought out by the witness, that discloses the original Transwrap machine. 218

The Court: I will give you an opportunity for redirect examination. I think the last question was very vague.

Q. Do you understand the structure that is described in paragraph numbered 1 of this letter? In other words, does the description that is given in paragraph number 1 enable you as an expert of the package machine to understand what it is? A. Yes, I understand it.

Q. Now, my question is simply, with that understanding, is what is there described, disclosed in the drawings or is it described in the patent which you saw this morning? A. I would have to look over the patents to see what was in there. I know we had certain material to have the packages stronger, but I don't remember whether there was one of a heating or the thermo plastic coating. 219

Q. Do you understand what is meant by paragraph 2 as to the invention of this Transwrap machine? A. I do.

Q. Can you answer the same question with respect to that? Is that suggestion disclosed or described in any of the patents that you reviewed this morning? A. As I remember it, I do not think there is any of them that show

220 *Zwoyer—Cross*

any methods of interlocking the seam seal as described in this paragraph.

Q. Will you do the same in respect to paragraph 3? You understand the suggestion there contained, do you not? A. That is right. I understand that.

Q. And does that suggestion happen to be incorporated in any of the patents that you reviewed this morning? A. I would say a part of it.

Q. What patent do you have in mind? A. Any patents where they describe the machine set in the horizontal posi-
221 tion.

Q. How about paragraph number 4? A. I do not know that any of them embody anything that is brought out in paragraph number 4. It is merely attempting to patent a use of a particular type of web, as I understand the paragraph.

Q. How about paragraph number 5?

The Court: Is this all supposed to show that the plaintiff conceived some devices and submitted it to the defendant in accordance with 12?

Mr. Darby: Yes, sir. We submitted it to the
222 defendant and defendant did nothing about taking patents out on the suggestions and we did.

The Court: Will you please point out the language of the letter that corresponds to the statement that you just made?

Mr. Darby: Well, take number 1, if you please. The paragraph reads:

"All of these would be based on a tubular package structure formed from a single web of material and sealed at both ends either by pressure or heat, or both, and sealed along the longitudinal seam"—

The Court: What has that to do with the statement? Will you point out anything in the letter that corresponds with the statement?

Mr. Darby: Well, the first part of my statement was that we submitted the ideas to the defendant. That is covered by paragraph 3 of the letter.

The Court: But that has nothing whatever to do with your contract. You can submit ideas until you are blue in the face and it has nothing to do with the contract.

Mr. Darby: The contract requires us, as I read 224
it, to submit—

The Court: I have read the contract. It is perfectly plain. A child could understand it. You and I have no differences whatever about what the contract says, absolutely none. Nor have we any differences as to what constitutes performance of it.

Mr. Darby: Well, I don't know just exactly how to meet your Honor's remark there. I agree that the contract is perfectly plain as to that provision. It says that if we should discover or invent an improvement and so forth, we shall submit the same to the 225
licensor.

The Court: Is there anything in this letter about submitting an invention and a discovery?

Mr. Darby: Yes, sir, just what I read to your Honor. May I read paragraph two?

The Court: I did read it three or four times.

Mr. Darby: This says "We think we should endeavor to fortify the use of various forms of packages, and suggest that either you or we or both in cooperation with each other, should apply for some method patents covering various packages which might be made on this Transwrap machine, and all

226 *Zwoyer—Cross*

these would be based on a tubular structure." He is reciting and making suggestions and giving the description. It was understandable to Mr. Zwoyer, the inventor of the machine, and the defendant did not apply for a patent on the suggestions, and the plaintiff did.

The Court: He is not required to apply or make any election on the suggestion. He is supposed to make an election on the discovery or invention.

Mr. Darby: These were submitted to him as dis-
227 covery or invention.

The Court: Where does it say so?

Mr. Darby: In the second paragraph:

> "In a similar way, we think we should endeavor to further fortify the use of a package such as it made on the Transwrap packaging machine, and we suggest that either you or we, or both in cooperation with each other, should apply for some method patents covering various forms of package as might be made on the Transwrap packaging machine. All of these would be based
228 on"—

and then come the specific suggestions.

The Court: All right.

Mr. Darby: Where was I? Had I covered paragraph 5, Mr. Zwoyer?

A. No, we didn't.

Q. Will you answer the same question with respect to paragraph 5 as to whether or not the suggestion contained in that paragraph is shown or described in the patents that you reviewed? A. To the best of my knowledge I do not believe there is.

Q. I call your attention to the postscript in the letter reading:

> "In addition, the use of an inert gas flowed down through the filling tube while the package is being filled might be a patent which we could secure in connection with this package even though it is probable that Liquid Carbonic Company has the broader patents covering this matter of introducing the gas, usually CO_2 gas or nitrogen gas."

Was that suggestion incorporated in several of the patents 230
that you reviewed? A. Yes, it is.

Q. And that suggestion, by the issuance of those patents, was indicative to you, was it not, that it was a patentable suggestion? A. It was in doubt at the time because the matter was discussed by both Mr. Maxfield and myself, and we both felt there would be a slim chance of patenting the patent.

Q. But there is no doubt that the patents have been obtained? A. Yes; however the patents have been obtained.

Q. You testified, I believe, Mr. Zwoyer, that no one in-
formed you that applications for patents were being made 231
on any developments that had resulted from the work of Stokes & Smith? A. Definitely so.

Q. You were in very frequent contact with the work that was going on over at the Stokes & Smith plant, were you not? A. I was.

Q. Was anything concealed from you as far as you know in connection with the required work on these machines? A. Originally I felt that Mr. Maxfield attempted keeping me from going out into the plant. However, I was never stopped. I went out into the plant whenever I felt there was something there I wanted to see.

232 Q. In other words, did you not feel that you were entitled to have and actually take the right, exercise the right of going through the plant wherever possible? A. I exercised the right of going through the plant even though in the beginning I felt something in the atmosphere trying to keep me out.

Q. You had constant opportunities to see the changes that were being made in the machine? A. Definitely.

Q. In fact you knew of all changes? You had to approve them? A. Not necessarily, but I looked them over to
233 help to develop the machine in such a way that it would be acceptable to the customer and would be a salable article.

Q. And you were cooperating to that end? A. We were both definitely cooperating.

Q. And as fast as a change was made in the machine you were afforded an opportunity to express your viewpoint as to whether it was a good change or a bad one? A. That is right.

Q. So you were familiar with all the changes that were made? A. I was familiar with all the changes that were made on the machine whenever a machine was built and
234 sold to a customer.

Q. And when these new items, such, for example, as the injection of gas into the package were incorporated on the machine structure, you knew it was different from anything that had been made by Transwrap prior to the date of the agreement? A. I would not say that there was anything different than had been made by Transwrap because we had tried it out previous to the time we had given the machine to Stokes & Smith.

Q. You knew from your discussions with Mr. Maxfield for example that there was a question in his mind—at least it was his opinion, that application for patents should be filed on his suggestions? A. Yes.

Q. Did you ever make inquiries as to whether or not applications had been filed? A. No, I did not make any inquiries because I did not feel it was necessary.

Q. And that was true throughout your relations with the company up to the time that the letter was written in January, 1944, I think it was—you made no inquiries as to what patents, if any, Stokes & Smith had applied for for any inventions relating to the Transwrap machine? A. To the Stokes & Smith Company I never made any inquiry of any kind.

The Court: Was there any reason why you should? 236

Mr. Darby: I think so.

The Court: What is it? What does such an obligation stem from?

Mr. Darby: It seems from these considerations: inventions submitted to the defendant company; the defendant company takes no steps to apply for a patent. No steps were taken to conceal the fact that a patent had been applied for.

The Court: If you prove that I will give you judgment, on any one of them. 237

Mr. Darby: All right, I think I have proven it. Perhaps not to your Honor's satisfaction, however, That is all.

Mr. Adams: That is all. Defendant rests.

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T. 165

The Court: I would say now that both sides have rested on the direct case, I do not see much ambiguity in the clause I was worried about. My original ruling was that it appeared ambiguous to

238 *Plaintiff's Rebuttal*

me and I took evidence on it pending my determination whether there was any ambiguity or not. Of course I do not know as much as the lawyers who drew the contract, or I didn't, and therefore what the meaning of the word "contents" was or why it was put in there didn't seem reasonable, but in view of the exhibits that were put in this morning, I do not see much ambiguity to it now.

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T. 170

239

Plaintiff's Rebuttal.

Mr. Darby: I first will renew my motion to strike the testimony of Mr. Zwoyer which purported to construe the language of the agreement, which your Honor reserved me the right to do.

The Court: Denied.

Mr. Darby: I have three or four letters that come under the stipulation, requiring no further proof, that I will offer in evidence. One is the letter of October 29, 1937, to Mr. Zwoyer, from Mr. Maxfield. I ask your Honor to read the letter.

240

Mr. Adams: I fail to see the relevancy of this, your Honor. On its face it is a suggestion to Transwrap to take out a patent on one of their inventions. It is no notice that Stokes & Smith made an invention. It says: "We believe that an effort should be made to take out a patent on this device, and because it was developed by you, it would seem more in order for you to take action regarding the patent."

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241

T. 173

The Court: I will allow it.

(Marked Plaintiff's Exhibit 7.)

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Mr. Darby: I also offer in evidence a letter dated September 1, 1939, to Stokes & Smith, signed William F. Heide, President of Transparent-Wrap Corporation. I ask your Honor to read that letter in the event there is an objection to its receipt.

242

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T. 175

Mr. Adams: I object on the ground of irrelevancy.

The Court: What do you say it is material to?

Mr. Darby: It is material to the testimony of Mr. Zwoyer. At the time I objected to it because I didn't think it was relevant or material at all when your Honor allowed Mr. Zwoyer to testify to some exhibits, I couldn't tell you the numbers now to go in—on reconsideration of a prior standing of my objection to the exhibits—one of the things that induced the defendant to enter into this agreement was the expensive experimental work that we did and the confidence that we would do it well.

243

The Court: What does this relate to?

Mr. Darby: It shows there is a limitation to that. The president of the company took the position that the experimental work should not require more than two years' time.

The Court: Objection overruled.

(Marked Plaintiff's Exhibit 8.)

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244 *Schaeffer—Direct*

T. 176

CARL E. SCHAEFFER, called as a witness on behalf of plaintiff in rebuttal, being first duly sworn, testified as follows:

Direct examination by Mr. Darby.

Q. Mr. Schaeffer, you reside in Philadelphia? A. Yes, sir.

Q. And you are an officer of the Stokes & Smith Company? A. Yes, sir.

245 Q. How long have you been associated or connected with the Stokes & Smith Company? A. Forty years.

Q. And in your official capacity do you have charge, direct charge over the records of the company? A. Yes, I do.

The Court: What officer are you?

The Witness: Assistant secretary and sales manager.

Q. And have you had under your supervision and direction made a list and the prices of the Transwrap machines
246 which were made and billed to the Transwrap Machine Corporation and H. Heide, Inc.? A. I have.

Q. You have? A. Yes.

Mr. Darby: Under the agreement, your Honor, you will recall that there is one provision that obligates the plaintiff to make for the defendant that, and I am putting this in merely because it completes the entire picture so your Honor will have the overall picture of the entire operation.

Q. Is this list that I hand you the correct and complete record taken from the books of your company as to those transactions? A. That is correct.

Mr. Darby: I offer it in evidence.

Mr. Adams: I am sure I am mystified as to this one.

The Court: Do you object?

Mr. Adams: Yes, on the ground it is irrelevant.

The Court: Sustained.

Mr. Darby: May I have it marked for identification?

(Marked Plaintiff's Exhibit 9 for Identification.)

248

Q. Have you likewise from the records of your company had made year by year an enumeration of the experimental expenses on Transwrap machines incidental to the required work done by the company? A. That is correct.

Q. Is the sheet I hand you the correct transcript of those items? A. That is right.

Mr. Darby: I offer this document in evidence, if the Court please, and I remind the Court that two of the defenses to the counterclaim are laches and equitable estoppel, to show the change or financial position of the plaintiff company due to the silence 249 of the defendant company.

Mr. Adams: I object. I think it is irrelevant.

The Court: I will overrule the objection.

Mr. Adams: May I point out, your Honor, under the contract they are obligated to use their best efforts.

The Court: Yes.

(Marked Plaintiff's Exhibit 10.)

Q. Have you similarly prepared from the records of the company by years the amounts expended by Stokes & Smith in advertising the Transwrap machine? A. I have.

250 *Schaeffer—Direct*

Q. And is the list that I hand you the list which purports to accurately and completely give those items? A. That is correct.

Mr. Darby: I offer it in evidence.

Mr. Adams: Same objection.

The Court: Overruled.

Mr. Adams: Here again the Stokes & Smith Company was required by the contract to do that.

(Marked Plaintiff's Exhibit 11.)

251 Q. Have you similarly from the records of the company prepared a list of the patent expenses in procuring patents of the company? A. I have, yes, sir.

Q. Over that period? A. Yes.

Q. And is the list that I hand you purported to be the correct and complete list of those patent expenses, totaling $11,692.16? A. That is correct.

Mr. Adams: I object to that. It is not connected with the patents that we are here talking about.

The Court: Is this for these 15 patents, or for additional patents also?

252 Mr. Darby: I do not know how many. I will ask the witness.

Q. Does this list purport to be for the patents that are in evidence in this case in the book of exhibit patents? A. This covers 16 patent cases.

The Court: I will allow it.

(Marked Plaintiff's Exhibit 12.)

Mr. Adams: There is nothing on here to indicate what patents they were, your Honor.

The Court: I know there is not.

Q. Do these relate exclusively to the Transwrap machine? A. Yes.

The Court: That I would call the baldest kind of conclusion.

Mr. Darby: On what do you base that, your Honor?

The Witness: I have here the patent numbers, the date, and the cost for each case.

Mr. Darby: Do you want a copy of this?

Mr. Adams: Yes.

Q. I wish you to identify each of the cases on the list—

* * * * * * * * * * *

T. 182

By Mr. Darby:

Q. Referring to the paper which has been offered and marked as Plaintiff's Exhibit 12, what does the designation appearing thereon, SS 3713, refer to? What patent does that refer to? A. Patent No. 2,160,367.

Mr. Darby: And for your Honor's convenience, that is tab No. 5.

The Court: Yes.

Q. Next, with respect to company's SS 3714? A. Patent 2,146,831.

Mr. Darby: Which is tab No. 3.

Q. And the next is SS 3715? A. Patent No. 2,154,521.

Mr. Darby: Which is tab No. 4.

Q. And SS 3719? A. Patent No. 2,199,708.

Mr. Darby: That is tab No. 6.

256 Q. SS 3721. A. Patent No. 2,146,308.

Mr. Darby: That is tab No. 2.

Q. SS 381? A. Patent No. 2,145,941.

Mr. Darby: That is tab No. 1.

Q. SS 391. A. Patent No. 2,200,971.

Q. SS 392. A. Patent No. 398,332.

Mr. Darby: I might say I believe that that is an application for a patent.

257 Mr. Adams: We haven't heard of that one, your Honor.

Mr. Darby: Neither had I. Mr. Woodcock advises me it is a Canadian patent.

Mr. Adams: We haven't heard of it, even so.

Mr. Darby: Neither did I.

Q. SS 394. A. That is also a Canadian one.

Q. What is the number? A. 397,338.

Mr. Adams: We haven't heard of that one either.

Mr. Darby: That explains the total of 16 rather than 14.

258 Q. And SS 399? A. Patent No. 2,259,866.

Mr. Darby: Tab No. 10.

The Court: What are these "SS" numbers that you are reading?

The Witness: That is the case number.

The Court: Your case number?

The Witness: Yes.

The Court: And have you got a sum of money against that?

The Witness: Yes, sir.

Q. SS 3910? A. Patent 2,260,064.

Mr. Darby: Tab No. 11.

Q. SS 3911? A. No. 2,294,215.

Mr. Darby: That is tab No. 12.

Q. SS 3915? A. 2,257,823.

Mr. Darby: That is tab No. 9.

Q. SS 3916. A. 2,257,433.

Mr. Darby: That is tab No. 8. 260

Q. SS 4401. A. 2,330,015.

Mr. Darby: Tab No. 15.

Q. SS 4003. A. 2,294,220.

Mr. Darby: That is tab No. 13.

The Court: What was it you said this seems to prove?

Mr. Darby: It proves that relying on the muteness of the defendant we proceeded to go to the expense of procuring these patents in the belief that they belonged to us. 261

The Court: Would you call that a betrayal of your adversary's duty to you in any respect?

Mr. Darby: I think the whole doctrine of equitable estoppel is based upon an implied duty to do something rather than to remain quiet—

The Court: Assuming that your statement is a representation of what the evidence demonstrates to be the fact that would mean, as you just put it, you told them that one of these patents was to be taken care of and they refused to go ahead so you did. So what?

262 *Colloquy*

Mr. Darby: It went further than that. We told them we were taking out patents.

The Court: Yes?

Mr. Darby: And then we did. Now they are asking to have the patents assigned to them, and under the contract, we say even under that circumstance, the one your Honor gives—

The Court: I didn't know I was giving any circumstance. I was repeating your statement. I didn't understand it that way.

263 Mr. Darby: You were setting forth facts which I think exist as to one or more of the patents.

The Court: That is what I said I thought it was.

Mr. Darby: I am willing to accept that—

The Court: Do not accept anything. Please do not put words in my mouth. If you want the stenographer to read it you will see I said this is my understanding of what you said. I am not furnishing any ideas. I was trying to understand your statement.

Mr. Darby: That is one circumstance that I do say exists. There is another circumstance which I likewise say exists, and that is, where having received knowledge, their inactivity and their having obtained that knowledge that we were applying for patents, and their obtaining that knowledge, that, your Honor will recall not only from some of these documents which I have put in evidence but also as a result of the search weekly—weekly Official Gazette search made by the defendant's patent attorney, they received as many as seven, Mr. Adams stated, and they did nothing about it. We had called their attention to the fact—they did nothing in protest. Relying on that we proceeded to take out additional patents at considerable expense.

264

It is my impression and my argument that that is a factor of equitable estoppel which would prevent the defendant from requiring us to assign those patents to them. In other words, they are equitably estopped to ask for or get the relief that they ask for in their counterclaim. That is our position in a nutshell. 265

The Court: The contract said "failure of the Licensor to insist upon any of the terms, clauses, covenants and conditions of this License Agreement in any instance shall not, however, be deemed to be a waiver of default in subsequent instances." 266

Mr. Darby: Where is your Honor reading from?

The Court: Down near the end of the contract.

Mr. Darby: May I also direct your attention to the language in paragraph 12?

The Court: At the end of 14.

Mr. Darby: May I also direct your attention to the language in paragraph 12.

The Court: Whereabouts?

Mr. Darby: Right after the disputed sentence. This says: "In the event of the failure of Licensor so to apply for Letters Patent covering such additional improvements, inventions, or patentable ideas, the Licensee may apply for the same." 267

So I submit there is no betrayal whatever.

That is the end of the direct examination of this witness.

Mr. Adams: No cross examination.

Mr. Darby: Plaintiff rests.

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Mr. Adams: Defendant rests.

. . . . . .

268

Plaintiff's Exhibit 1.

THIS AGREEMENT made the 23rd day of June, 1937, between TRANSPARENT-WRAP MACHINE CORPORATION, a corporation organized and existing under and by virtue of the laws of the State of New York, having its principal place of business at No. 313 Hudson Street, in the Borough of Manhattan, City of New York (hereinafter called the "Licensor"), and STOKES & SMITH Co., a corporation organized and existing under and by virtue of the laws of the Commonwealth of Pennsylvania, having its principal place of business at Summerdale, City of Philadelphia, (hereinafter called the "Licensee"),

269

WITNESSETH:

WHEREAS, Letters Patent of the United States of America Nos. 1,986,422—2,047,243 and 2,037,555, Letters Patent of the Dominion of Canada No. 352,955 have been granted to or acquired by the Licensor for an automatic packaging machine and improvements thereto known and hereinafter referred to as "Transwrap Packaging Machine," and

WHEREAS, the Licensor is the owner of said Letters Patent and of all rights under the same, and

270

WHEREAS, the Licensee desires to acquire the sole and exclusive right and license (except as hereinafter set forth) to manufacture and sell Transwrap Packaging Machines and any invention or improvement therein during the continuance of this agreement;

NOW THEREFORE, it is mutually covenanted and agreed as follows:

1. The Licensor hereby grants and conveys to the Licensee the sole and exclusive right and license (exclusive of the Licensor and of all other parties) to manufacture

and sell throughout the United States and all territory to which United States Patent protection extends, and also throughout the Dominion of Canada and the Republic of Mexico, subject to the conditions hereinafter named, Transwrap Packaging Machines containing the inventions and/or improvements claimed in the aforesaid Letters Patent and/or in any other Patent for any invention or improvement in Transwrap Packaging Machines, or inventions operating upon the same general principles as, or used as substitutes for, the inventions now used in the said Transwrap Packaging Machines, which may be granted to or owned by the Licensor during the term of this agreement. The Licensee shall not grant any sub-license hereunder to any person, firm or corporation except with the written consent of the Licensor first had and obtained.

2. The Licensee agrees to keep true and correct books of account according to accepted accounting principals in which shall be recorded entries with respect to each Transwrap Packaging Machine manufactured and sold by it; and during the usual business hours, such books of account shall be open to the examination and inspection of the Licensor, or its duly authorized representatives.

3. The Licensee shall render and deliver to the Licensor on the first day of February, May, August and November in each year a full and accurate statement in writing of all Transwrap Packaging Machines manufactured and sold by it during the preceding quarter-annual period ending respectively on the previous December 31st, March 31st, June 30th and September 30th, and simultaneously with the rendition and delivery of such statement the Licensee shall pay to the Licensor all license fees or royalties which shall then be due to the Licensor hereunder. The first statement and payment hereunder shall be rendered and made on

274 *Plaintiff's Exhibit 1*

February 1, 1938 to cover the period from the date hereof to December 31, 1937.

4. The Licensee shall pay to the Licensor as a license fee or royalty on every large Transwrap Packaging Machine (known as type "C") sold by it the sum of Eight hundred and fifty Dollars ($850.00) and a license fee or royalty on every small Transwrap Packaging Machine (known as type "A" or "B") sold by it the sum of Eight hundred Dollars ($800.00); said license fees or royalties being based on a sales price of $4550.00 for type "C" Transwrap Packaging Machines and of $4250. for type "A" or "B" Transwrap Packaging Machines as the same are now being manufactured and used, payable upon the next quarter-annual payment date if the purchase price has been received by Licensee as hereinafter provided. In the event that a new type of Transwrap Packaging Machine should hereafter be developed and manufactured the sales price thereof and the license fee or royalty payable thereon shall be agreed upon by the Licensor and Licensee and, if they are unable to agree, the matter shall be referred to arbitration as hereinafter provided. The said royalties are based upon the sales prices referred to above and upon an estimated cost of production, as set forth in Schedule A hereto annexed, under present conditions of labor and material cost and market conditions. If, however, the Licensee finds it necessary to meet market conditions by change in prices, or if production cost increases and Licensee is not able to increase the sales price sufficiently to absorb such increased production cost, the royalties shall be adjusted between the Licensor and the Licensee accordingly, and if they cannot agree upon the adjustment, it shall be left to the arbitration hereinafter provided for, the basis for calculation of royalty and profits being that the Licensee shall receive its

275

276

manufacturing cost, including manufacturing overhead, plus 25% manufacturing profit, to which is to be added 20% of the net sales price received from the customer to cover sales expense, and the difference between the sum so arrived at and the net sales price is to be divided equally between the Licensor and the Licensee, representing royalty to the Licensor and profit to the Licensee. If the respective sales prices increase without an increase in the cost of production, the royalties shall also be adjusted accordingly and if the Licensor and Licensee cannot agree upon the adjustment, it shall be left to the arbitration hereinafter provided 278
for, the basis to be the same as that above set forth in case of an increase in the cost of production without an increase in sales price. All royalties shall be payable by the Licensee to the Licensor, at the times and for the periods above provided for in Paragraph 3, upon receipts from customers during the previous respective quarter-annual periods. Where machines are leased or sold on an installment payment plan under which the Licensee does not receive the full purchase price at the time of sale, one-half of the royalty or license fee shall be paid to the Licensor by the Licensee upon the quarter-annual payment date next there- 279
after ensuing and another one-quarter of said royalty or licensee fee quarter-annually thereafter until the full amount of such royalty or license fee shall have been paid, each payment to be included in the remittance to be made by the Licensee to the Licensor one month after the termination of the respective quarter-annual periods.

If the Licensee shall be unable, with due diligence, to collect the purchase price of any Transwrap Packaging Machine sold by it by reason of the insolvency of the purchaser or purchasers, the Licensee shall not be required to pay to the Licensor any license fee in respect of any such

280 Transwrap Packaging Machine; provided, however, that if the Licensee shall collect any part of the purchase price of any such Transwrap Packaging Machine so sold, then the Licensee shall, at the next quarter-annual payment date, pay to the Licensor, if such collection shall have been made or received by it, the ratable percentage of the license fee, based upon the selling price of the Transwrap Packaging Machine so sold.

It is understood and agreed that the sales price upon which the royalty is to be based, shall be exclusive of motors
281 but shall include any amount represented in the sale price to cover expense of demonstration and travelling expenses in connection therewith. If separate filling machines or apparatus are combined with the Transwrap Packaging Machine, the basis for the calculation of royalty shall be the sales price of the Transwrap Packaging Machine only, excluding the filling machine. The Licensee shall have the right to change the sales price whenever necessary in its judgment to meet competition or cover increased production costs, but if such change in price affects the Licensor's royalty, and the Licensor does not agree with the change
282 in price, the matter shall be referred to arbitration hereinafter provided, for decision. The Licensee may, however, at any time change prices, provided it agrees that such change shall not affect the Licensor's royalty.

5. The Licensor agrees to give to the Licensee, when requested by it, the benefit of its experience in the manufacture and sale of Transwrap Packaging Machines, including information as to machines already sold, inquiries from prospective customers and the names and addresses if any persons who, in the opinion of the Licensor, may have been or are likely to be interested in the purchase or installation of Transwrap Packaging Machines. It is understood

and agreed, however, that the Licensor shall not be called on to an extent which will unreasonably encroach upon the time of the Licensor's engineers. The Licensee agrees to pay all actual travelling and hotel expenses incurred by the Licensor's engineers in connection therewith, whenever such expenses are incurred at the request and by the authority of Licensee.

6. The Licensee agrees to use its best efforts to manufacture, market, promote sales and sell Transwrap Packaging Machines. 284

7. (a) The term of this license shall be for a period of ten years, commencing on July 1, 1937 and ending on June 30, 1947, unless sooner terminated as hereinafter provided.

(b) *Option to Renew.* It is understood and agreed, however, that the Licensee shall have the option to renew this License, with all its terms, from time to time for further periods of five years each, until the expiration of the Patents above referred to and the expiration of any further Patents that may be granted to or acquired by the Licensor or Licensee covering improvements in Transwrap Packaging Machines or inventions used or capable of use by the 285 Licensee in the manufacture thereof.

(c) *Notice.* In the event that the Licensee exercises its option to renew this License at the end of the first or any renewal term, it shall notify the Licensor of its intention so to do by notice in writing sent by registered mail to the Licensor at least one year prior to the termination of the then current term of this License.

(d) The right of the Licensee to exercise its option to renew this License from time to time shall be conditioned only upon—

286 *Plaintiff's Exhibit 1*

(1) Notice having been given to the Licensor as above provided;

(2) Compliance by the Licensee with all of the terms, clauses, covenants and conditions of this License Agreement;

(3) That the volume of sales of Transwrap Packaging Machines during the then current term of the License has been such as should reasonably be satisfactory to the Licensor. Should there be any dis-
287 agreement between the parties as to whether the volume of sales has been such as should reasonably be satisfactory to the Licensor, this question shall be submitted to arbitration in the manner hereinafter provided.

(c) Provided, however, that if the Licensor deems the volume of sales unsatisfactory, the Licensor must give the Licensee at least one year's notice of such condition before terminating the Agreement, during which period the Licensee shall have the opportunity of further developing and increasing the sales.

288 (f) Nothing in this paragraph contained shall be construed to prevent the Licensor from terminating this License under the procedure hereinafter provided for in paragraph 14, in the event of default by the Licensee.

8. (a) The Licensor agrees to sell to the Licensee and the Licensee agrees to purchase all of the jigs, fixtures and patterns now owned and used by the Licensor in connection with the manufacture of Transwrap Packaging Machines which the Licensee desires to use in connection with future manufacture or for record or experimental purposes or otherwise. Settlement shall be made therefor in cash at

prices which may be agreed upon between the Licensor and the Licensee.

(b) The Licensor also agrees to sell to the Licensee any Transwrap Packaging Machines or parts thereof now owned by the Licensor which the Licensee may desire to purchase, at prices agreed upon between them, settlement to be made in cash upon delivery.

(c) In the event of the termination of this License prior to the expiration of ten years, the Licensor agrees to purchase from the Licensee all of the jigs, fixtures and patterns 290
purchased by the Licensee from the Licensor and also all of those constructed by or for the Licensee under the terms of this agreement and which the Licensor desires to use, at cost thereof to the Licensee, less depreciation at the rate of 20% per annum. The Licensor also agrees to purchase from the Licensee such Transwrap Packaging Machines which the Licensor desires to use, whether finished or partly finished, and such parts for Transwrap Packaging Machines theretofore made by the Licensee which the Licensor desires to use, at a price agreed upon between them, settlement to be made in cash upon delivery. 291

(d) In the event that the Licensor and the Licensee cannot agree as to the purchase price of such jigs, fixtures, patterns or Transwrap Packaging Machines, or parts thereof, the price to be paid shall be submitted to arbitration in the manner hereinafter provided, the basis being cost, less depreciation at the rate of 20% per annum.

9. If the Licensor and Licensee, or either of them, should be sued by the holders of other Patents, claiming that in the manufacture of Transwrap Packaging Machines under the Patents which are the subject matter of this Agreement, they are infringing valid Patents of others, or if either the

292 Licensor or the Licensee shall discover what it shall consider to be an infringement of any of the said patents, such party shall at once communicate full particulars to the other. Representatives of the Licensor and Licensee shall thereupon confer and if they shall agree that action shall be taken then the proceedings for infringement shall be defended, or proceedings shall be instituted, in the name of the Licensor or of the Licensee, or both, as Counsel may request, in respect of such infringement, the cost and damages of all such proceedings shall be borne equally by the Licensor and the
293 Licensee and any damages recovered shall be divided equally between them.

In the event of disagreement between the Licensor and Licensee as to the advisability of defending any action brought against them or either of them, either party may defend such proceedings at its own cost and expense. In the event of disagreement between the Licensor and Licensee as to the advisability of instituting any affirmative action by reason of any infringement of any of said patents, and the Licensee considers it advisable that proceedings be taken, it shall be at liberty to take such proceedings at its own cost and expense in the names of the parties hereto or
294 either of them as it may deem necessary. If such proceedings are successful any damages recovered shall be retained by the Licensee, but if unsuccessful the expense thereof, and any damages awarded in favor of the party or parties proceeded against, shall be borne solely by the Licensee.

In the event of disagreement between the Licensor and the Licensee as to the advisability of instituting any affirmative action by reason of any infringement of any of said patents and the Licensor considers it advisable that proceedings be taken, it shall be at liberty to take such proceedings in its own name, at its own cost and expense. If such pro-

295

ceedings are successful any damages recovered shall be retained by the Licensor, but if unsuccessful the expense thereof and any damages awarded in favor of the party or parties proceeded against shall be borne solely by the Licensor.

10. Neither the Licensor nor the Licensee shall raise or cause to be raised any question with respect to, or any objection to the validity of the said Patents or any of them, on any ground whatsoever, nor shall the Licensee either directly or indirectly use or exercise the said Patents except 296
in accordance with the terms of this License Agreement.

11. During the term of this license all improvements to Transwrap Packaging Machines, or new inventions used or capable of use in connection therewith, whether made by the Licensor or by the Licensee, shall be deemed included within the terms of this license, without any additional consideration, or license fee or royalty being due to the Licensor for the use thereof. It is understood and agreed, however, that the Licensor shall have the right to use, and license the use of, outside the several territories covered by this License Agreement, any improvement or addition to Trans- 297
wrap Packaging Machines or any new inventions connected with such machines and used in making and/or closing the package, but not those applying to the filling or to the contents of the package, made, owned or controlled by the Licensee, but such right to use and enjoy such Patents or inventions shall be exclusive only with regard to their use in Transwrap Packaging Machines and Licensee shall have the free right to use and enjoy them in all other fields and in all other kinds and types of machines without the payment of any royalty to Licensor for such use.

298 *Plaintiff's Exhibit 1*

12. If the Licensee shall discover or invent an improvement which is applicable to the Transwrap Packaging Machine and suitable for use in connection therewith and applicable to the making and closing of the package, but not to the filling nor to the contents of the package, it shall submit the same to the Licensor, which may, at its option, apply for Letters Patent covering the same. In the event of the failure of the Licensor so to apply for Letters Patent covering such additional improvements, inventions or patentable ideas, the Licensee may apply for the same. In the event
299 that such additional Letters Patent are applied for and are granted to the Licensor, they shall be deemed covered by the terms of this License Agreement and may be used by the Licensee hereunder without any further consideration, license fee or royalty as above provided. In the event that any such additional improvements are patented by the Licensee for use in connection with Transwrap Packaging Machines, (after the refusal or failure of the Licensor to apply for Patents thereon), the Licensor may, nevertheless, have the use but not the exclusive use of the same outside of the several territories covered by this License Agreement.
300 The expenses of obtaining any such Patents shall be paid by the party applying therefor.

The Licensor agrees to apply for and pay the expenses of obtaining any renewals of said Patents owned or acquired by it. The Licensee shall have the full right to use and enjoy any of the said inventions in its other machines which do not compete with Transwrap Packaging Machines and to license others so to do, but in such case the Licensee shall re-imburse the Licensor for its cost in obtaining the Patents on said inventions on a basis to be agreed upon by the parties and if they fail to agree, the same shall be referred to arbitration as hereinafter provided.

13. The Licensee agrees to fill and complete any orders received from the Licensor for Transwrap Packaging Machines for shipment to or installation in: 301

(a) The plant or plants operated by The Borden Company in respect of which negotiations are now pending between The Borden Company and the Licensor;

(b) The factory operated by Henry Heide, Incorporated, and

(c) Territories not covered by this License Agreement or by other agreements between the parties; 302

Such orders shall be filled by the Licensee at a price f.o.b. Philadelphia, which shall not exceed the cost of manufacture, including overhead, calculated in accordance with Licensee's standard accounting practice, plus a profit of 25% and, when installation is required, the cost of installation.

14. In the event that any one or more of the following events (herein termed events of default) shall occur and such default shall not be cured within thirty days after written notice thereof by the Licensor to the Licensee, this agreement may be terminated by the Licensor in the manner hereinafter provided. 303

The following and each of the following shall constitute events of default:

(a) Failure of the Licensee to keep true and accurate books of account;

(b) Failure of the Licensee to permit the Licensor or its duly authorized representatives to examine and inspect the same;

304 *Plaintiff's Exhibit 1*

(c) Failure of the Licensee to render to the Licensor full and accurate statements in writing of all Transwrap Packaging Machines manufactured and sold by it;

(d) Failure of the Licensee to pay the full amount of the license fees or royalties hereinabove provided for as and when the same shall be due and payable;

305 (e) If the Licensee shall be adjudicated a bankrupt, or shall file a Petition under Section 77-B of the Bankruptcy Act, or any Act amendatory thereof, or if the Licensee shall take advantage of any bankruptcy or insolvency act;

(f) If by reason of any action taken by or against the Licensee the payment of license fees or royalties shall be enjoined or suspended;

(g) If the Licensee shall be dissolved or liquidated (other than in connection with a corporate
306 reorganization and the continuance of the business of the Licensee); and

(h) If the Licensee shall default in any of the terms, clauses, covenants and conditions of this License Agreement.

Should such an event of default have occurred and not been cured within thirty days after written notice thereof by the Licensor to the Licensee, this license shall be deemed terminated upon a date fixed in a further written notice of

termination to be sent by the Licensor to the Licensee by registered mail, which date shall not be less than ten days after the expiration of the thirty days hereinabove referred to.

Failure of the Licensor to insist upon any of the terms, clauses, covenants and conditions of this License Agreement in any instance shall not, however, be deemed to be a waiver of default in subsequent instances.

15. In the event of the termination of this License Agreement by reason of default on the part of the Licensee, 308
prior to its expiration under the provisions of paragraph "7" hereof, the Licensee shall not be discharged from any liability to the Licensor which shall have arisen or accrued prior to the date of termination.

16. In the event that any dispute, controversy or claim shall arise between the Licensor and the Licensee out of or relative to this License Agreement or the breach thereof, including any question under the provisions of paragraph 14 as to whether or not an event of default has occurred, and/or if it has occurred, whether it has been cured within the thirty-day period, the same shall be settled by arbi- 309
tration, in accordance with the Rules, then obtaining, of the American Arbitration Association, and judgment upon the award rendered may be entered in the highest court of the forum, state or federal, having jurisdiction.

17. All notices to be given hereunder shall be addressed to the respective parties hereto at the addresses hereinabove set forth.

18. This agreement shall be binding upon and enure to the benefit of the parties hereto, their respective successors and assigns.

Plaintiff's Exhibit 1

IN WITNESS WHEREOF the Licensor and the Licensee have caused this agreement to be executed by their respective officers thereunto duly authorized and their corporate seals hereunto affixed the day and year first above written.

TRANSPARENT-WRAP MACHINE CORPORATION (Seal)

By "WILLIAM F. HEIDE"

President

Attest:

"HENRY HEIDE JR."

Secretary

STOKES & SMITH COMPANY (Seal)

By "J. STOGDELL STOKES"

President

Attest:

"CHARLES EVANS"

Secretary

313

Plaintiff's Exhibit 2.

TRANSPARENT-WRAP MACHINE CORPORATION
313-321 Hudson St. New York, N. Y.

January 22, 1944

Stokes & Smith Co.
4900 Summerdale Ave.
Philadelphia, Pa.

Attention: Mr. J. S. Stokes, President.

314

Gentlemen:

This notice is sent to you pursuant to the provisions of the license agreement between you and the undersigned, dated June 23, 1937.

You are hereby notified that the undersigned claims that an event of default under said contract has occurred in that you have, through your agents, obtained four or more patents on inventions applicable to the Transwrap Packaging Machine without first submitting such inventions to the undersigned to enable it, if it so desired, to apply for Letters Patent thereon in accordance with the provisions of paragraph 12 of said license agreement.

315

Four of the patents to which we refer are the following:

Patent No. 2,160,367—Applied for by Daniel E. Maxfield and assigned to you;

Patent No. 2,200,967—Applied for by John R. Sonneborn and Jonathan Y. Albertson and assigned to you;

316 *Plaintiff's Exhibit 2*

Patent No. 2,257,823—Applied for by John S. Stokes and assigned to you; and

Patent No. 2,145,941—Applied for by Daniel E. Maxfield and assigned to you.

The patents enumerated above have been cited to us by the United States Patent Office as interferences affecting our patent application with reference to our Fin-Seal Package Mechanism.

317 The underisgned hereby demands that you assign and set over to it all of the patents obtained by you as well as any information with reference to patents pending or patents applied for with regard to Transwrap Packaging Machines.

Your attention is directed to the provisions of paragraph 14 of said license agreement, under which you have thirty (30) days from the date hereof within which to cure your default.

Yours very truly,

318 TRANSPARENT-WRAP MACHINE CORPORATION

(Signed) William F. Heide

President.

WFH/JG

Copy: Mr. M. B. Amend
P. Merkel

Plaintiff's Exhibit 3.

319

TRANSPARENT-WRAP MACHINE CORPORATION

313-321 Hudson Street New York, N. Y. U. S. A.

April 17, 1944

Stokes & Smith Co.
4900 Summerdale Ave.
Philadelphia, Pa.

Attention: Mr. J. S. Stokes, President.

Dear Mr. Stokes:

Mr. Zwoyer, Mr. Engel and Mr. Amend have reported to us on their conversation with you and your associates 320
in Philadelphia last Thursday and our Board of Directors has considered the matter at great length today.

We take the position that the failure of Stokes & Smith Co. to submit to us the inventions relating to Transwrap Machines covered by its various patents, and to afford us the opportunity to apply for the patents, is a clear breach of the License Agreement of June 23, 1937. We understand that you and your counsel construe the agreement otherwise and take the position that you are under no obligation to assign said patents to us.

Under the circumstances we have come to the conclusion 321
that the question of whether a breach of the agreement has occurred should be submitted to arbitration in accordance with Paragraph 16. We are therefore taking steps to have the matter referred to arbitration.

We are unwilling to enter into a new agreement that is not based upon the premise that all patents relating to the Transwrap Machine should be assigned to and be owned by our Corporation.

Yours very truly,

TRANSPARENT-WRAP MACHINE CORPORATION

/s/ Henry H. Heide, Jr.
Secretary

HH-Jr/JG

322 **Plaintiff's Exhibit 4.**

TRANSPARENT-WRAP MACHINE CORPORATION

313-321 Hudson Street New York, N. Y. U. S. A.

April 29, 1944

Stokes & Smith Co.
4900 Summerdale Ave.
Philadelphia, Pa.

Attention: Mr. J. S. Stokes, President.

323 Gentlemen:

Reference is made to the license agreement between us, dated June 23, 1937, and particularly the paragraph numbered 14 thereof.

Because of your failure to cure the default specified in our letter of January 22, 1944 within thirty days after written notice of such default, we have elected to terminate the license agreement on May 10, 1944.

This notice is sent to you pursuant to the provisions of paragraph 14 of the said license agreement.

Yours very truly,

324 TRANSPARENT-WRAP MACHINE CORPORATION

/s/ Herman L. Heide

Herman L. Heide
Director & Treasurer

HLH/JG

Plaintiff's Exhibit 5.

Feb. 7, 1939. D. E. MAXFIELD 2,145,941

METHOD OF AND APPARATUS FOR MAKING PACKAGES

Filed April 18, 1938

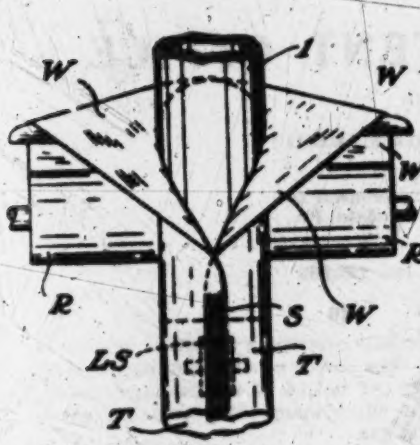

Fig. 1.

Fig. 2.

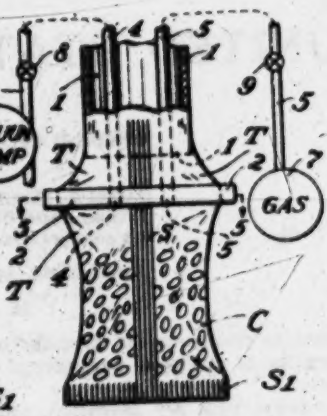

Fig. 3.

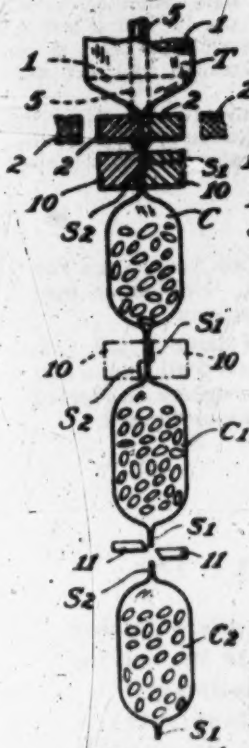

Fig. 4.

Fig. 4a.

Fig. 5.

Fig. 4b.

Fig. 7.

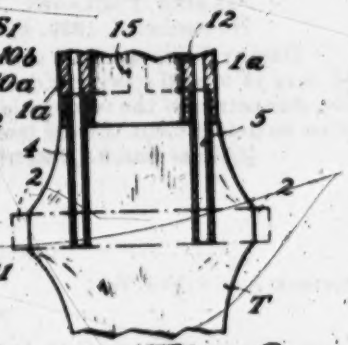

Fig. 6.

INVENTOR

Daniel E. Maxfield

BY

Theodore Z. Cabot

ATTORNEY

5/6

Plaintiff's Exhibit 5

Patented Feb. 7, 1939 2,145,941

UNITED STATES PATENT OFFICE

2,145,941

METHOD OF AND APPARATUS FOR MAKING PACKAGES

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application April 18, 1938, Serial No. 202,663

14 Claims. (Cl. 93—3)

My invention relates to the manufacture, filling and sealing of gas-tight packages of flexible web material.

In accordance with my invention, after each package is filled at atmospheric pressure, but before final sealing thereof and detachment from the web material, the air is withdrawn therefrom and, if desired, may be replaced with a suitable conditioning gas.

In accordance with my invention, the margins of one or more webs of suitable flexible material, preferably a material which consists of, is impregnated with, or coated with a thermo-plastic, are joined, as by application of heat and pressure, to form a tube which is transversely flattened by a gas, or gases, having a beneficial or preserving effect. The choice of conditioning gas is determined by the nature of the package contents and desired effect upon those contents of the conditioning gas.

Although these ends have been accomplished by various methods when the package contents to be preserved are in rigid containers such as metal cans, bottles or the like, those methods are not applicable to flexible packages or containers during their formation from web material.

In accordance with my invention, these ends are accomplished by inclusion of the steps of exhausting the air and replacing it with the con-

DISCLAIMER

2,145,941.—*Daniel E. Maxfield*, Philadelphia, Pa. METHOD OF AND APPARATUS FOR MAKING PACKAGES. Patent dated February 7, 1939. Disclaimer filed November 8, 1939, by the assignee, *Stokes and Smith Company*.

Hereby disclaims from the subject matter and scope of each of claims 1, 2, 3, 4, 5, 13, and 14 of said specification, those methods which are not characterized by the fact the exhaustion of the receptacle or container, while exposed to atmosphere, is effected prior to detachment thereof from the web or sheet material from which formed.

[*Official Gazette November 28, 1939.*]

CERTIFICATE OF CORRECTION.

Patent No. 2,145,941. February 7, 1939.

DANIEL E. MAXFIELD.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, line 2, and in the heading to the printed specification, address of assignee, after "Summerdale," insert --Philadelphia,--, as shown by the record of assignments in this office; page 1, second column, line 55, for "W" read --web W--; page 2, first column, line 38, strike out the comma after the word "modified"; page 3, first column, line 69, claim 6, after "material" insert a comma; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of February, A. D. 1941.

Henry Van Arsdale,

(Seal) Acting Commissioner of Patents. 5/1

Plaintiff's Exhibit 5

Patented Feb. 7, 1939 2,145,941

UNITED STATES PATENT OFFICE

2,145,941

METHOD OF AND APPARATUS FOR MAKING PACKAGES

Daniel K. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Susmerdale, Pa., a corporation of Pennsylvania

Application April 18, 1938, Serial No. 202,865

14 Claims. (Cl. 93—3)

My invention relates to the manufacture, filling and sealing of gas-tight packages of flexible web material.

In accordance with my invention, after each package is filled at atmospheric pressure, but before final sealing thereof and detachment from the web material, the air is withdrawn therefrom and, if desired, may be replaced with a suitable conditioning gas.

In accordance with my invention, the margins of one or more webs of suitable flexible material, preferably a material which consists of, is impregnated with, or coated with a thermo-plastic, are joined, as by application of heat and pressure, to form a tube which is transversely flattened at intervals to form a series of containers, and, after each container is, in turn, filled with its intended contents, and before its severance from the webbing, it is flattened above or beyond its contents to close or seal off the interior thereof except for provision permitting its subsequent communication with a vacuum pump or equivalent and thereafter with a source of suitable conditioning gas; after exhaustion of air from the container and replacement thereof by suitable gas, the sealing of the container is completed, and it is thereafter severed from the web.

My invention further resides in the methods and systems hereinafter described and claimed.

For an understanding of my invention, reference is to be had to the accompanying drawing, in which:

Fig. 1 in elevation shows formation of a tube from web material;

Fig. 2 illustrates flattening of the tube of Fig. 1 to form a container;

Fig. 3, partly in section and in part diagrammatic, illustrates a step of package formation subsequent to Figs. 1 and 2;

Fig. 4, partly in section, illustrates the remaining steps of one method for making gas-filled packages;

Figs. 4a and 4b illustrate an alternative method of completing the package of Figs. 1 to 3;

Fig. 5 is a plan view in section, taken on line 5—5 of Fig. 3;

Fig. 6 is a detail view, on enlarged scale, of modification of parts appearing in Figs. 1 to 3;

Fig. 7 is a plan view in section of the filling tube construction of Fig. 6.

For the packaging of many products, it is desirable that little or no air or oxygen be permitted to remain in the package for contact with the contents; moreover, it is often desirable that the air removed from the package be replaced by a gas, or gases, having a beneficial or preserving effect. The choice of conditioning gas is determined by the nature of the package contents and desired effect upon those contents of the conditioning gas.

Although these ends have been accomplished by various methods when the package contents to be preserved are in rigid containers such as metal cans, bottles or the like, those methods are not applicable to flexible packages or containers during their formation from web material.

In accordance with my invention, these ends are accomplished by inclusion of the steps of exhausting the air and replacing it with the conditioning gas as part of a continuous method which involves the formation of containers, filling thereof, exhaustion of air, introduction of conditioning gas, complete sealing of the packages, all of which steps are performed before the packages are detached from the webbing and without need to enclose the packages in a vacuum tank or equivalent.

Specifically referring to Fig. 1, the web W, which is generically illustrative of a single or multi-ply web of any suitable flexible material, for example, "Pliofilm", "Diafane", "Protectoid", moisture-proofed Cellophane or waxed-paper, is withdrawn from a roll R and shaped about a tube 1 of suitable size to form tubing T having longitudinally thereof a seam S which is formed by joinder of the overlapping margins of the web. Preferably the W consists of, or is impregnated with, or coated with, a thermo-plastic in which case the seam or seal S may be formed simply by pressure of a heated roll LS applied to press the overlapping web margins against the periphery of the forming tube 1.

Below the lower open end of the forming tube 1 the tubing T is flattened, as by application of suitable heated tools, to provide a seal S1 extending across the tubing to form the bottom of a container C whose upper, open end is in communication with the lower open end of the forming tube 1; after seal S1 has been formed, the intended contents of the container, for example, medicinal powders or tablets, tobacco, food products, or the like, may be introduced into the interior thereof through the forming tube 1.

After the container C has been so filled, it is flattened above its contents, as by the two resilient clamping members 2, 2 (Figs. 4 and 5) which cut off communication between the interior of the container and the filling tube 1 which is open to atmosphere. Being yieldable, the clamping

Plaintiff's Exhibit 5

members 2, 2 permit tubes 4 and 5 to be utilized for communication of the interior of the container with a suitable air-exhausting apparatus, such as vacuum pump 6, and with a source of conditioning gas 7. Whether or not the members 2, 2 need be relieved or cut away to afford a good seal at the region adjacent tubes 4, 5 depends later also upon the shape and size of the tubes.

After the clamping tools 2, 2 have moved to the position indicated in Figs. 3 and 5 to effect a temporary seal, the valve 8 is opened to exhaust the air from the container C, the contents of the package preventing its collapse under atmospheric pressure which throughout the methods herein described is always exerted on the exteriors of the packages. When the exhaustion has proceeded to suitable extent, valve 8 in the vacuum line 4 is closed and valve 9 in the gas line 5 is opened to permit a desired vapor or gas, such as nitrogen, carbon dioxide or a mixture of gases, from the source 7 to enter the package. It is desirable the valves 8 and 9 be located as near as possible to the open ends of pipes 4, 5 for minimum cost of vacuum and gas equipment and for most economical operation.

The tubing T forming the upper part of container C may then be flattened below the soft clamps 2, 2, as by heated clamping tools which permanently seal the upper end of the container C, thus to complete the formation from web material of a package whose contents are within a protective gas. The container C becomes an individual container upon severance of the tubing T above the upper seal.

For continuous production of gas-filled packages, there may be utilized a machine similar to that disclosed in Zwoyer Patent 1,986,422, or Aldrich Patent 1,937,501, suitably modified, to incorporate additional clamping tools corresponding to the resilient clamping tools 2, 2, and to include pipes 4, 5 and the other necessary auxiliaries herein mentioned for removal of air from and supply of gas to the containers as they are in turn formed. It is not necessary for performance of the methods herein described that the supply hoppers or any of the package-forming mechanism be within a vacuum chamber.

Referring to Fig. 4, and in explanation of those steps of one method of completing a package, which steps are subsequent to those of Figs. 1 to 3, after the container C has been filled with gas and before separation of the resilient clamping tools 2, 2, the heated clamping tools 10, 10 flatten the upper end of the container suitably below the lower ends of the pipes 4, 5 thus to complete the sealing of the container C and to prevent ingress of air or other gas upon separation of the clamps 2, 2. The seal formed by the heated clamping tools 10, 10 comprises the sealing section S2 for the upper end of the container C and the sealing section S1 for the bottom of the next container to be filled.

The clamping tools 10, 10 while in engagement with the web or tubing T are moved downwardly to their dotted line position, Fig. 4, thus to bring the seal S1, S2, between two previously formed containers C1, C2, in position for operation thereon of the knives 11, 11 to detach from the web a complete gas-filled package C2, and also to draw more of the web W from the roll R about the forming tube 1 for ultimate formation of similar packages.

From the foregoing, it is to be understood that each container, in turn, is formed on tube 1 filled with its intended contents, connected in sequence to the vacuum pump and a source of conditioning gas, and then sealed and detached from the web.

The method which forms the subject matter of Pat. [illegible] is satisfactory for many kinds of web material and for many sorts of products, but in the case of packaging products of the web material [illegible] becomes apparent that the clamping tools 2, 2 draw the web tightly around the tube 4, 5 as aforementioned. To avoid this difficulty there may be utilized the alternative method whose steps, subsequent to the steps of Figs. 1 to 3, are exemplified in Figs. 3a and 4b. In accordance with this method, before the resilient clamping tools 2, 2 are moved away from their position of Figs. 3 and 5, the top of container C is flattened below tools 2, 2 by the heated clamping tools 10a, 10a, which form the seal S2 closing the upper end of the container C, then after separation of the resilient clamping tools 2, 2, the heated clamping tools 10b, 10b flatten the tubing T to form the seal S1 of the next container and thus section S1 includes those regions where the resilient clamping tools 2, 2 had previously stretched the webbing around the tubes 4, 5. Thus, whether or not the web is weakened by the stretching there of about conduits 4, 5 is of no consequence because these weakened areas are reinforced or healed when joined in the seal S1 and, in any event, are not in such location that if broken through permit escape of gas from the package.

While all four tools 10a, 10b are in engagement with the web, they move downwardly to the dotted line position, Fig. 4b, to bring the webbing to such position that upon operation of the knives 11, 11, each flattened sealing section between two adjacent containers is divided to detach from the webbing or tubing T a completed gas-filled package whose lower end is sealed by seal S1 and the upper end by the seal S2.

The methods herein described are not limited to use of a single web whose margins are overlapped, but is equally applicable to other methods of forming filled packages from one or more webs, such as are exemplified in my copending application, Serial Nos. 183,427 and 190,569, filed January 5, 1938 and February 15, 1938, respectively.

As indicated in Figs. 6 and 7, the pipes 4 and 5, for connection of the interior of the successive containers with a vacuum pump and a source of conditioning gas, may be threaded into the bottom of forming tube 1a which actually, or in effect, comprises an outer forming tube about which the webbing W is formed into tubing T and inner or filling tube 12 through which the contents of the packages are introduced and the annular space between the tubes 1a and 12 is divided into two passages 13 and 14 maintained independent of each other by the bushings 15, 15. The lower end of each of these passages 13 and 14 is closed except for an opening which receives one or the other of the pipes 4, 5. Connection of the passages 13 and 14, vacuum pump and gas supply is afforded by pipes 4a, 5a which join the tube 1a suitably above the region at which the web W is turned around the tube.

The upper end of filling tube 12 is in communication with a hopper [illegible] equivalent source of material for filling of the package. The hopper and filling tube are at all times [illegible] with atmosphere and need not be [illegible] filling tank or equivalent [illegible] from the source solely to meet [illegible]

In any of the modifications [illegible]

5/2

desired to replace the air exhausted from the packages with a conditioning gas, the tube 5 or equivalent may be omitted, plugged, or valve 6 left closed.

What I claim is:

1. The method which comprises forming a receptacle from sheet material, filling and sealing the receptacle to form a gas-tight package, and, between said filling and sealing of the receptacle, and while its exterior is exposed to atmospheric pressure, withdrawing air therefrom by producing a vacuum therein.

2. The method which comprises forming a receptacle from sheet material, filling the receptacle while its interior is in communication with atmosphere, and thereafter and while the exterior of the receptacle is exposed to atmospheric pressure exhausting air from the receptacle by production of a vacuum therein and sealing the receptacle.

3. The method which comprises forming a receptacle from sheet material, filling the receptacle while its interior is in communication with atmosphere, and thereafter, and while the receptacle is exposed externally to atmospheric pressure, effecting withdrawal of air from the receptacle to exhaust it, introduction of a conditioning gas into the exhausted receptacle, and sealing of the receptacle.

4. The method of making, filling and sealing packages which comprises joining the margins of web material to form a flexible tube, flattening the tube transversely to form a receptacle open at one end, filling the receptacle through said end while its interior is in communication with atmosphere, and thereafter, and while the receptacle is exposed to atmosphere, partially closing said end of the receptacle and discontinuing communication of the interior thereof with atmosphere, withdrawing air from the container through said partially closed end, and subsequently sealing said receptacle.

5. The method of making, filling and sealing packages which comprises joining the margins of web material to form a flexible tube, flattening the tube transversely to form a receptacle open at one end, filling the receptacle through said end while its interior is in communication with atmosphere, and thereafter, and while the receptacle is exposed to atmosphere, partially closing said end of the receptacle to interrupt communication of the interior thereof with atmosphere, withdrawing air from the container through said partially closed end, replacing the air with conditioning gas, and subsequently sealing said receptacle.

6. The method of making, filling and sealing packages which comprises joining the margins of web material to form a flexible tube, flattening the tube transversely at spaced intervals to form sealed packages in succession filling the packages by introducing material into the tube between successively flattened sections thereof, severing the tube transversely through the flattened sections to detach the packages in turn from the web material, and, after filling of each of the packages and while it is externally exposed to atmosphere and attached to said tube of web material exhausting the package interior of gas to effect removal of air therefrom.

7. The method of making, filling and sealing packages which comprises joining the margins of web material to form a flexible tube, flattening the tube transversely at spaced intervals to form sealed packages in succession filling the packages by introducing material into the tube between successively flattened sections thereof, severing the tube transversely at the flattened sections to detach the packages in turn from the tube of web material, and, after filling of each of the packages and while it is externally exposed to atmosphere and attached to said tube of web material, producing a vacuum within the package interior to exhaust it of air and subsequently introducing a conditioning gas into the exhausted receptacle.

8. A system for forming, filling and sealing packages comprising a filling tube over which tubing of sheet material is drawn, means for flattening and transversely sealing the tubing to form a receptacle filled through said filling tube, a source of vacuum, a hollow member extending beyond said filling tube and providing for communication between said source and said receptacle, resilient means for flattening the tubing about said member to prevent communication of the interior of said receptacle with atmosphere and to permit withdrawal of air therefrom, and means for transversely flattening and sealing the tubing between the filling material of said receptacle and said resilient means.

9. A system for forming, filling and sealing packages comprising a filling tube over which tubing of sheet material is drawn, means for flattening and transversely sealing the tubing to complete closure of a filled package and to close one end of a receptacle to be filled through said tube, a source of vacuum, a hollow member extending beyond said filling tube and providing for communication between said source and said receptacle, and resilient means for flattening the tubing about said member, after filling of said receptacle and in advance of complete closure and sealing thereof by said first means, to prevent communication of the interior of said receptacle with atmosphere and to permit withdrawal of air therefrom.

10. A system for forming, filling and sealing packages comprising a filling tube over which is drawn tubing of sheet material, a source of vacuum, a hollow member extending beyond said filling tube and providing for communication between said source and the interiors of the successive packages after filling thereof, resilient temporary-sealing means for flattening the tubing and clamping it about said member to isolate the interior of a filled package from atmosphere and to permit withdrawal of air therefrom, and means for transversely sealing the tubing between the contents of each package and said temporary-sealing means before disengagement of the latter from the tubing.

11. A system for forming, filling and sealing packages comprising a filling tube over which is drawn tubing of sheet material, a source of vacuum, a hollow member extending beyond said filling tube and providing for communication between said source and the interiors of the successive packages after filling thereof, resilient temporary-sealing means for flattening the tubing and clamping it about said member to isolate the interior of a filled package from atmosphere and to permit withdrawal of air therefrom, and means for transversely sealing the tubing between the contents of each package and said temporary-sealing means before disengagement of the latter from the tubing and for thereafter transversely severing the tubing at a location previously clamped by said temporary-sealing means.

12. A system for forming, filling and sealing

5/3

packages comprising a filling tube over which tubing of sheet material is drawn, a source of vacuum, a source of conditioning gas, hollow structure extending beyond said filling tube providing for connection to said sources of the interiors of packages in succession formed from said tubing, resilient temporary-sealing means for flattening the tubing and clamping it about said structure during connection of the interior of a filled package with said sources, and means for transversely flattening and permanently sealing the tubing between the contents of each package and said temporary-sealing means before disengagement of the latter from said tubing.

13. The method which comprises forming a receptacle from sheet material, filling the receptacle while its interior and exterior are exposed to atmospheric pressure, thereafter reducing the pressure interiorly of the filled receptacle to exhaust air therefrom while its filling supports its wall structure against the external atmospheric pressure, and thereafter sealing the exhausted receptacle.

14. The method which comprises forming a receptacle from sheet material, filling the receptacle while its interior and exterior are exposed to atmospheric pressure, thereafter reducing the pressure interiorly of the filled receptacle to exhaust air therefrom while its filling supports its wall structure against the external atmospheric pressure, thereafter introducing a conditioning gas into the exhausted receptacle, and thereafter sealing the receptacle to retain the conditioning gas and the filling protected thereby.

DANIEL E. MAXFIELD.

5/4

Plaintiff's Exhibit 5

Feb. 7, 1939. D E MAXFIELD 2,146,308

METHOD OF MAKING PACKAGES

Filed Feb. 15, 1938

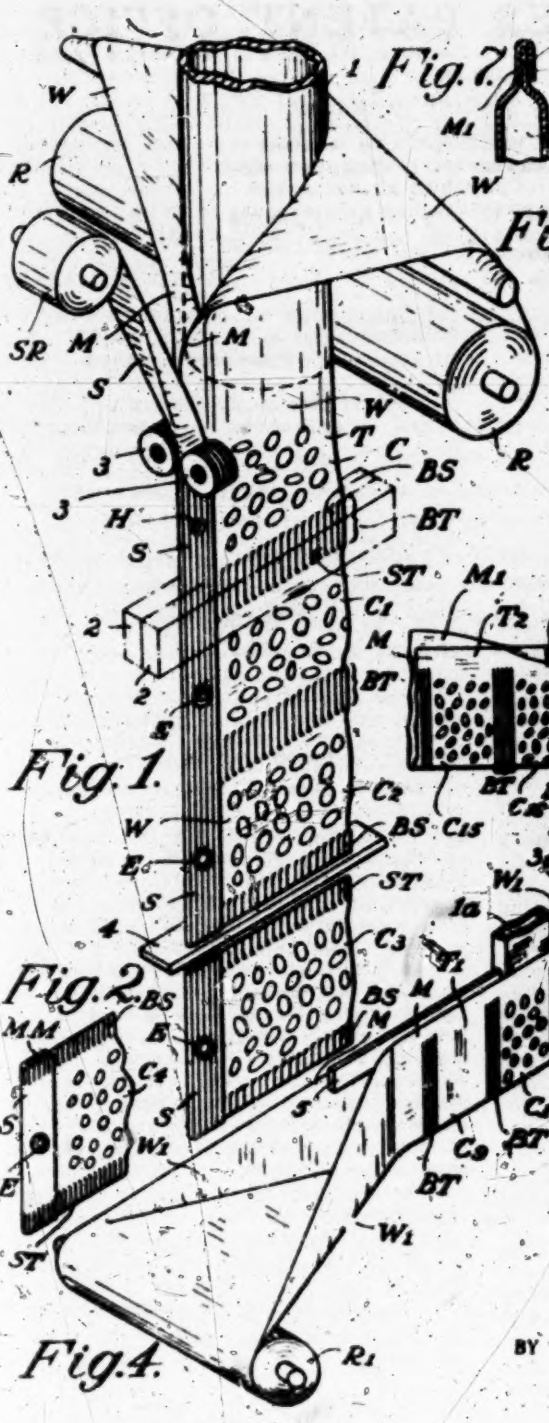

Fig. 1.

Fig. 2.

Fig. 4.

Fig. 7.

Fig. 3.

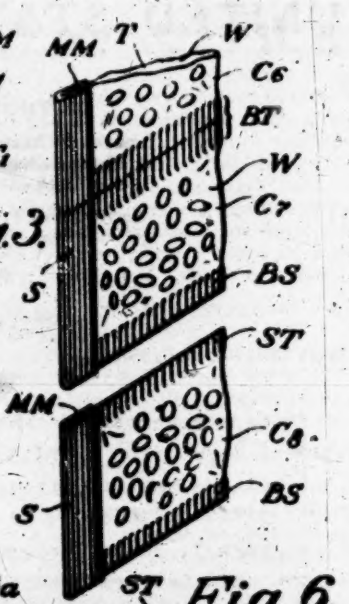

Fig. 6.

Fig. 5.

INVENTOR.

Daniel E. Maxfield

BY Cornelius D. Chase

ATTORNEY.

5/12

Plaintiff's Exhibit 5

Patented Feb. 7, 1939 2,146,308

UNITED STATES PATENT OFFICE

2,146,308

METHOD OF MAKING PACKAGES

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Lommerdale, Pa., a corporation of Pennsylvania

Application February 15, 1938, Serial No. 190,370

9 Claims. (Cl. 93—3)

CERTIFICATE OF CORRECTION.

Patent No. 2,146,308. February 7, 1939.

DANIEL E. MAXFIELD

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, line 2, and in the heading to the printed specification, address of assignee, after "Lommerdale," insert --Philadelphia,--; as shown by the record of assignments in this office; page 1, second column, line 26, for "extend" read --extents--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of January, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

silent fastening means, so spaced, longitudinally of the tube, that at least one of them appears in the cap or clip of each container.

Further, when the container is of material, such as Cellophane, which is easily torn, the capping strip is preferably of different material, such as paper, having materially greater tensile strength; and, when the container web is of material, such as waxed or oiled paper, Cellophane or the like, involving unusual cost or difficulty in printing thereon, the capping strip is preferably of different material, or of differently surfaced material, better suited for printing.

Also in accordance with my invention, the caps or clips may be made from the package web itself by forming the tube with projecting margins of unequal width and thereafter folding the wider margin over and into engagement with the other margin to which it is attached thermoplastically or by adhesive, eyelets, or both.

My invention further resides in the methods of making packages hereinafter described and claimed.

For an understanding of my invention reference is to be had to the accompanying drawing in which

Fig. [illegible] is a perspective view [illegible] a series of containers [illegible] their manufacture;

web, move downwardly to extend substantially corresponding to the width of the package to be formed. As the tube T is formed and pulled downwardly, the flange M, M projecting therefrom is capped by the narrow strip S of suitable material drawn from the roll SR. The capping strip S is clamped by the tools 2, 2 concurrently with their flattening of the tube T so that simultaneously with feeding of web W by the tools 2, 2, the strip S is progressively applied to embrace the margins M, M of the web.

The narrow strip or web S may be of thermoplastic material, that is the strip S may be of material which is itself thermo-plastic or of suitable material coated or impregnated with a thermo-plastic. During or after application of strip S to embrace the margins M, M heat and pressure may be applied across the rolls 3, 3, preferably grooved, to unite the strip S to the margins M, M and to unite the margins M, M [illegible] to seal the edges of the [illegible] and apply a reinforcement or cap to the seal.

The clamping tools 2, 2 are preferably heated so that when they flatten the tube T as above described there is produced the sealing section ST [illegible] the bottom of the [illegible] surrounds the [illegible] receptacle C[illegible]

Plaintiff's Exhibit 5

Patented Feb. 7, 1939 2,146,308

UNITED STATES PATENT OFFICE

2,146,308

METHOD OF MAKING PACKAGES

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application February 15, 1938, Serial No. 190,570

9 Claims. (Cl. 93—3)

My invention relates to the manufacture, filling and sealing of packages or containers made of flexible material, and particularly material, such as Cellophane or other film, which is easily torn and/or presents unusual cost or difficulty in printing thereon.

In accordance with my invention, a web, preferably of thermo-plastic material, is formed into a tube with the longitudinal margins of the web projecting side by side from the tube; the tube is transversely flattened at intervals, with concurrent application of heat to the flattened portions, to form a series of containers; before, during, or after filling of each container a second narrow web or strip is applied to overlie, cap or embrace the projecting web margins so that, when the tube and the applied web or strip are severed from their webs, there results a detached filled package having an individual cap or clip. More particularly, the narrow capping strip or web may be of thermo-plastic material joined upon application of heat to the margins of the main web embraced thereby, or, alternatively, or in addition, the capping strip may be held in margin-embracing position by eyelets, or equivalent fastening means, as spaced, longitudinally of the tube, that at least one of them appears in the cap or clip of each container.

Further, when the container is of material, such as Cellophane, which is easily torn, the capping strip is preferably of different material, such as paper, having materially greater tensile strength; and, when the container web is of material, such as waxed or oiled paper, Cellophane or the like, involving unusual cost or difficulty in printing thereon, the capping strip is preferably of different material, or of differently surfaced material, better suited for printing.

Also in accordance with my invention, the caps or clips may be made from the package web itself by forming the tube with projecting margins of unequal width and thereafter folding the wider margin over and into engagement with the other margin to which it is attached thermo-plastically or by adhesive, eyelets, or both.

My invention further resides in the methods of making packages, hereinafter described and claimed.

For an understanding of my invention, reference is to be had to the accompanying drawing wherein:

Fig. 1, in perspective, illustrates a series of [illegible] stages of their manufac-

Fig. 2 is a fragmentary perspective view of a modified form of container;

Fig. 3, in perspective, illustrates the final stages of a modification of the method of Fig. 1;

Fig. 4, in perspective, illustrates another method of forming containers from a continuous web;

Fig. 5 is a perspective view of a package produced by the method of Fig. 4;

Fig. 6 illustrates a still further method of producing capped packages from web material;

Fig. 7 is a sectional view, on enlarged scale, of the capped end of a package produced by the method of Fig. 6.

Referring to Fig. 1, the web W of any suitable flexible material, such as moisture-proof Cellophane, "Dufane", "Pliofilm", or the like, which is itself a thermo-plastic, or of any suitable flexible material which is impregnated or coated with a suitable thermo-plastic, is drawn from the roll R over the forming tube 1 to form a tube T from which project the margins M, M of the web. The feeding of the web W may be effected by tools 2, 2 which move toward each other to flatten the tube T below the end of the forming tube 1 and thereafter, while still holding the web, move downwardly to extend substantially corresponding to the width of the package to be formed. As the tube T is formed and pulled downwardly, the flange M, M projecting therefrom is capped by the narrow strip S of suitable material drawn from the roll SR. The capping strip S is clamped by the tools 2, 2 concurrently with their flattening of the tube T so that simultaneously with feeding of web W by the tools 2, 2, the strip S is progressively applied to embrace the margins M, M of the web.

The narrow strip or web S may be of thermo-plastic material, that is, the strip S may be of material which is itself thermo-plastic or of suitable material coated or impregnated with a thermo-plastic. During, or after, application of strip S to embrace the margins M, M, heat and pressure may be applied, as by the rolls 3, 3, preferably grooved, to join the strip S to the margins M, M and concurrently to join the margins M, M to each other, thus concurrently to seal the edge of the tube and to apply a reinforcement or cap to the seal.

The clamping tools 2, 2 are preferably heated so that when they flatten the tube T, as above described there is produced the sealing section BT comprising the seal BS forming the bottom of one receptacle C, whose open top surrounds the forming tube 1, and the seal ST closing the upper edge of the previously filled receptacle C1.

By intermittent feed of the web, there is thus produced a series of filled and sealed containers joined to each other by the flattened sealed sections BT between them and by the continuous strip S. The containers are, in turn, detached from the tube T, as by suitable knife structure 4 which severs the flattened seal section BT between two adjacent filled and sealed containers, such as C2, C3, and also concurrently cuts the applied capping strip S.

Particularly when it is intended the individual packages be hung from hooks on a display board or strung along a wire, holes H are punched through the strip S and the embraced margins M, M to receive the eyelets E which are inserted in advance of knife 4, or equivalent, which detaches the containers from the webbing. The intervals between the holes H are such that at least one eyelet appears in the capped edge or clip of each container.

When the nature of the contents does not require substantially perfect sealing of the containers, it is not necessary that rolls 3, 3 or their equivalent be heated, or that heat be applied to the margins M, M of the web before or after application of strip S; in such event, the tools 2, 2 may be of such extent that the seals BS and ST extend entirely across the tube and also across the applied strip S thus to join the strip S to the web material at least at the areas ultimately forming two corners of the completed package (Fig. 2) and in addition, or alternatively, the strip S may be held to the margins M, M by the eyelets E.

Thus in accord with Figs. 1 and 2, each package is provided with an individual cap, overseal, or clip S joined to opposite edges of the container and through which may be an eyelet E. When the eyelets E are omitted, it is preferable that strip S be joined to margins M, M throughout its length (Fig. 3), as by application of heat. The resulting packages, C8 of Fig. 3, may be detached in turn from tube T by cutting the tube T transversely through the flattened sealing sections BT.

Strip S may be held to the margins M, M solely by eyelets E, in which event the margins are joined to each other and the sealing sections BT are formed prior to the application of strip S: the resulting package is shown in Fig. 5. Because the cap or seal presents a flat surface, unbroken by sealing ridges, this method is preferred when it is desired that printing appear on the cap or overseal; in such case the capping strip S is preferably of paper, or the like, better suited for printing than transparent film, such as Cellophane, of which the web W may be comprised.

Any of the forms of package previously described may be made in accordance with the method illustrated in Fig. 4 of which it is characteristic the margins M, M of the web are not joined until after filling of the containers formed from the web. Specifically, the web W1 fed from the roll R1 is formed into a tube T1 which is open longitudinally because of separation of the margins M, M, as by the bar 8. The open tube T1 is flattened, as by heated clamping tools similar to tools 2, 2 of Fig. 1, to provide a series of containers C9–C14 connected to each other by transverse sealing sections BT which terminate short of the edges of the web. As each container in turn passes below the filling tube 1a, or equivalent, it receives its intended contents. Beyond the filling tube 1a, the margins M M of the web W are joined, as by passage between the heated rolls 3a, 3a, and then capped by strip S which is fed from roll SR and brought into position to embrace the margins M, M, as by the rolls 3, 3. Strip S may be of heat-sealing material, in which event the rolls 3, 3 are heated to join strip S to the previously joined margins M, M, or alternatively, the capping strip of heat-sealing material may be folded over the margins M, M in advance of rolls 3a, 3a so that by a single operation the margins are joined to each other and to the capping strip. In the latter case, the rolls 3, 3 may be omitted.

If it is unnecessary to procure continuous joinder of strip S with the margins, holes H, H may be punched through the margins and the capping strip to receive eyelets E so spaced that at least one of them appears in each package. Strip S, as removed from roll R, may have printing thereon, such as advertising matter, a trade name, or directions of use, or such printing may be impressed upon the strip S at any time prior to its arrival at the station where the finished containers are cut from the tube T1.

It is characteristic of the individual packages C3, C4, C5, and C8 that each comprises a web element having margins which are joined to form the sealed edges ST, BS of the package and having margins which are capped by a clip fastened thereto and comprising therewith a third edge of the package.

At least some of the advantages of modifications previously described may be procured without need to resort to separate capping strip; specifically referring to Fig. 6, the tube T2 formed from the web of material, generally as in Fig. 4, is unsymmetrical, having one margin M1 substantially wider than the other margin M. The margins are left unjoined, as in the method of Fig. 4, until after filling of the individual containers, whereupon the wider margin M1 is folded over and joined to the narrow margin M in any suitable manner, specifically by application of heat and/or by eyelets E as herein specifically described in connection with the other modifications.

For brevity, the term "thermo-plastic" shall be understood to relate to the surface characteristics of the web or film, whether it itself consists of thermo-plastic material, or is a non-thermo-plastic material either impregnated with thermo-plastic material or coated therewith on either or both sides.

While preferred methods and packages have been specifically illustrated and described, it is to be understood my invention is not limited thereto but is coextensive in scope with the appended claims.

What I claim is:

1. The method of making filled sealed packages which comprises forming from a web of flexible material a tube from which the margins of the web project side by side, flattening and sealing the tube transversely at intervals to form a series of containers joined by flattened sealing sections, filling the containers, capping and sealing the web margins, and thereafter transversely severing the webbing through the flattened sealing sections to detach filled capped packages.

2. The method of making filled sealed packages which comprises forming from a web of flexible material a tube from which the margins of the web project side by side, flattening and sealing the tube transversely at intervals to form a series of containers joined by flattened [illegible]

Plaintiff's Exhibit 5

filling the containers, applying a strip of flexible material to overlie and connect with the projecting web margins, and thereafter transversely severing a tube and its applied strip through a flattened sealing section to constitute a detached filled sealed package having an individual clip overlying an edge thereof.

3. The method of making filled sealed packages which comprises forming from a web of flexible material a tube from which the margins of the web project side by side, adhesively applying a strip of flexible material to overlie and connect with the projecting web margins, thereafter flattening and sealing the tube transversely to form a series of containers joined by flattened sealing sections and the applied strip, filling the containers, and thereafter transversely severing a tube and its applied strip through a flattened sealing section to constitute a detached filled sealed package having an individual clip overlying an edge thereof.

4. The method of making filled sealed packages which comprises forming from a web of flexible material a tube from which the margins of the web project side by side, effecting continuous joinder of the projecting margins of the web, applying a separate strip of flexible material to overlie the projecting margins, at intervals along the tube inserting fastening members through the applied strip and the margins embraced thereby, flattening and sealing the tube transversely to form a series of containers joined by flattened sealing sections, filling the containers, and thereafter transversely severing the applied strip and the tube through the flattened sealing sections in succession to detach the filled sealed packages.

5. The method of making filled sealed packages which comprises forming from a web of flexible thermo-plastic material a tube from which the margins of the web project side by side, applying a strip of flexible thermo-plastic material to overlie the projecting web margins, applying heat and pressure to join the margins to each other and the applied strip to said margins, flattening the tube transversely with concurrent application of heat to form a series of containers formed by flattened sealing sections, filling the containers, and thereafter transversely severing the applied strip and the tube through the flattened sealing sections to detach filled sealed packages.

6. The method of making filled sealed packages which comprises forming from a web of flexible thermo-plastic material a tube from which the margins of the web project side by side, applying heat to effect joinder of the margins, applying a strip of flexible material to overlie the projecting web margins, thereafter flattening the tube and strip transversely with concurrent application of heat to form a series of containers joined by flattened sealing sections, filling the containers, and thereafter transversely severing the applied strip and the tube through the flattened sealing sections to detach filled sealed packages therefrom.

7. The method of making filled sealed packages which comprises forming from a web of flexible thermo-plastic material a tube from which the margins of the web project side by side, applying heat to join the projecting margins, applying a strip of flexible thermo-plastic material to overlie the projecting web margins, thereafter flattening the tube and strip transversely with concurrent application of heat to form a series of containers joined by flattened sealing sections, filling the container, inserting eyelets through the applied strip and the embraced margins at intervals spaced longitudinally of the tube, and thereafter transversely severing the applied strip and the tube through the flattened sealing sections to detach filled sealed packages each having an individual clip with an eyelet therethrough.

8. The method of making filled sealed packages which comprises forming from a web of flexible thermo-plastic material a tube from which the margins of the web project side by side, flattening and sealing the tube transversely to form a series of containers joined by flattened sealing sections, filling the containers, applying heat to join the projecting margins, thereafter applying a strip of flexible material to overlie the web margins, effecting joinder of the applied strip to the margins and thereafter transversely severing the applied strip and the tube through the flattened sealing sections to detach filled sealed packages each having an individual clip overlying an edge thereof.

9. The method of making filled sealed packages which comprises forming from a web of flexible thermo-plastic material a tube from which the margins of the web project side by side, flattening the tube transversely to form a series of containers joined by flattened sealing sections, filling the containers, thereafter applying heat to join the web margins, securing a strip of flexible material in position to overlie the projecting web margins by a series of eyelets passed through the strip and the margins, and thereafter transversely severing the applied strip and the tube through the flattened sealing sections to detach filled sealed packages.

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Plaintiff's Exhibit 5

Feb. 14, 1939. D E MAXFIELD 2,146,831

METHOD OF MAKING CONTAINERS

Filed Jan. 5, 1938 2 Sheets-Sheet 1

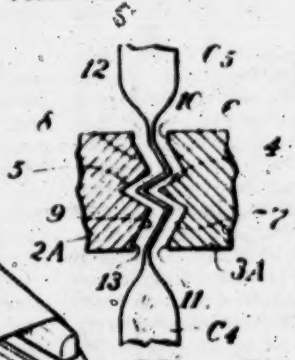

Fig. 5.

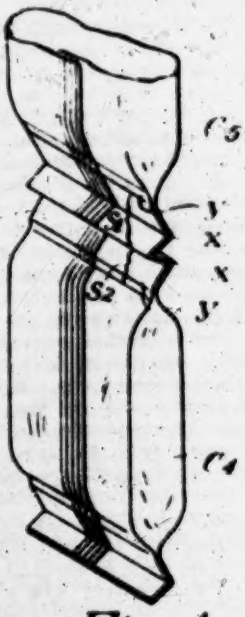

Fig. 4.

Fig. 2.

Fig. 9.

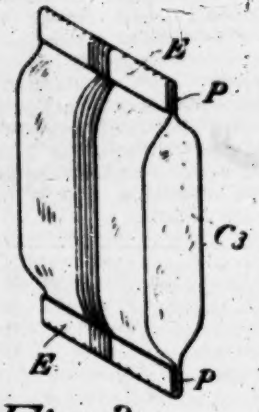

Fig. 3.

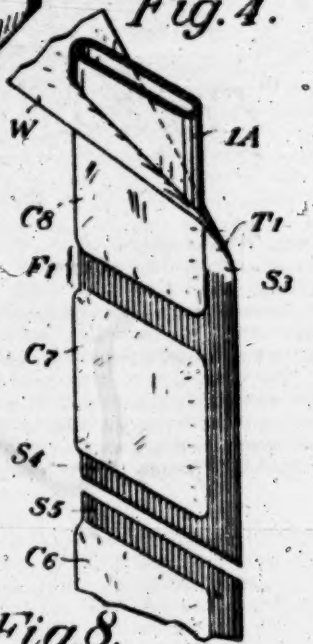

Fig. 8.

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METHOD OF MAKING CONTAINERS

Filed Jan. 5, 1938 2 Sheets-Sheet 2

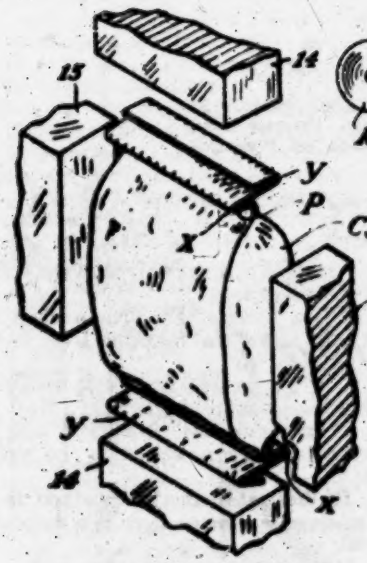

Fig. 6.

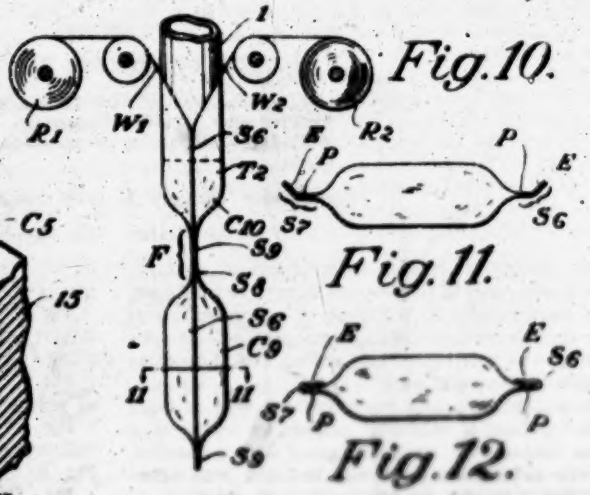

Fig. 10.

Fig. 11.

Fig. 12.

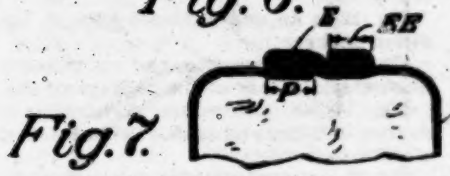

Fig. 7.

Fig. 13.

Fig. 16.

Fig. 15

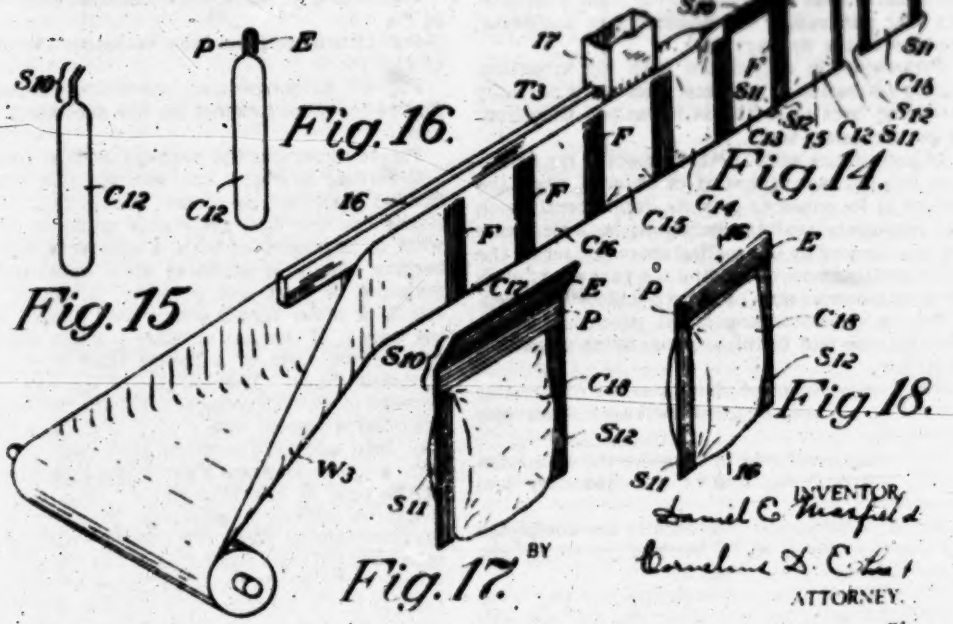

Fig. 14.

Fig. 17.

Fig. 18.

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5/21

Plaintiff's Exhibit 5

Patented Feb. 14, 1939

2,146,831

UNITED STATES PATENT OFFICE

2,146,831

METHOD OF MAKING CONTAINERS

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Philadelphia, Pa., a corporation of Pennsylvania

Application January 5, 1938, Serial No. 183,437

23 Claims. (Cl. 93—3)

My invention relates to methods of making, filling and sealing flexible containers or packages, and particularly to methods of operating upon one or more webs of flexible material to form containers which are filled and sealed, and thereafter detached from the web.

In accordance with my invention, one or more webs of flexible material preferably comprising webs, coated with, or impregnated with, a thermoplastic substance, is or are brought into tube-forming relation; by application of pressure, or heat and pressure, to the web margins and to longitudinally spaced transverse portions of the tube, there is formed a series of sealed containers each detached from the tube or web after filling and complete closure thereof; from each of the containers so formed and sealed there project two or more seals, the number of projecting seals depending upon the type of web-margin seal or seals, and at least one of these projecting seals or specially defined portion thereof is turned or folded into attachment with itself, as by application of heat and pressure, to form a secondary seal minimizing the possibility of accidental rupture of the primary seal.

Preferably, in accordance with my invention, during formation of a primary seal, it is partially folded or bent to facilitate formation therefrom of the secondary seal.

In accordance with another aspect of my invention, the package is shaped, or squared, when the nature of its contents permits, concurrently with the secondary sealing operation; in which case the seal formed by the sealing operation serves the additional purpose of holding the package in such form or shape as may have been imposed thereon.

For an understanding of my invention, reference is to be had to the accompanying drawings, in which:

Fig. 1, in perspective, illustrates the progressive formation of sealed filled packages from web material;

Fig. 2 is a detail view illustrating the formation of the primary seal and of the secondary seal elements;

Fig. 3, in perspective, illustrates the completed package produced by a method including the steps shown in Figs. 1 and 2;

Fig. 4 illustrates a modification of Fig. 1 in which the primary seal is of slightly different form;

Fig. 5 is a detail view illustrating a modified form of primary sealing tools;

Fig. 6, in perspective, illustrates the squaring up of a package concurrently with the formation of the secondary seal;

Fig. 7 is a fragmentary cross-section on enlarged scale of the seal resulting from the operations of Fig. 6;

Fig. 8, in perspective, illustrates another form of producing sealed packages from a web;

Fig. 9, in perspective, illustrates one of the individual packages produced by the method of Fig. 8;

Fig. 10 illustrates another method in which the containers are made from two webs of sheet material;

Fig. 11 is a sectional view taken on line 11—11 of Fig. 10;

Fig. 12 is an end sectional view of the completed package;

Fig. 13, in perspective, and on enlarged scale, illustrates a corner of the package of Fig. 12;

Fig. 14, in perspective, illustrates another method of filling and sealing packages made from a continuous web;

Fig. 15 is a sectional view taken on line 15—15 of Fig. 14;

Fig. 16 is a sectional view taken on line 16—16 of Fig. 15;

Fig. 17, in perspective, shows the package of Fig. 14 completed except for the secondary seal; and

Fig. 18 illustrates the package in final form.

Referring to Fig. 1, the web W, of a suitable flexible material, as paper, metal foil, "Cellophane" or the like, preferably made of, coated with, or impregnated with, a substance suited to become plastic or adhesive upon application of pressure, or heat and pressure, is drawn from roll R or other supply source over a rigid forming tube 1, of circular or other suitable shape, to assume the form of a hollow tube T of corresponding shape. The margins of the web W are brought into overlapping or overlying relation and are pressed against tube 1, as by a suitable heated tool, into adherent relation with each other, to form a continuous seal S extending longitudinally of the tube of web material T. The web W is fed, preferably intermittently, from the roll R progressively to form the tube T which is flattened beyond the forming tube 1 at recurrent intervals P to divide it into a series of containers such as C, C1, C2, etc. The feeding and flattening of the tube may be performed by suitable tools, such as the heated clamps 2, 3, Fig. 2; the tools 2, 3, or equivalent, flatten the tube T at suitable distance below the open end of the former 1 to close one end, as C1, which

previously has been filled, and concurrently to define and close the bottom of another container, C2, whose upper end is still open to receive the intended package contents which are discharged thereinto through a duct or opening in the forming tube 1.

During downward movement of tools 2, 3 to draw the web material around forming tube 1, the interior faces of the flattened section of the tube T are adhesively joined as by softening of the thermo-plastic substance of which the web is comprised or with which it is impregnated or coated. For convenience, this step of the method is termed the primary sealing operation.

The portions P of the tube, flattened by the clamping tools 2, 3, between contiguous or adjacent containers C1, C2, may be considered as divided into two adjacent sealing sections S1, S2, one of which seals the lower end of container C2, and the other of which seals the upper end of container C1. As each pair of successively formed containers assumes the position of containers C and C1 of Fig. 1, the lowermost flattened portion P of the tube T is transversely severed, as by a suitable knife structure, to separate or detach the lowermost filled and sealed container C.

From one end of each container extends the sealing section S1 and from the other end thereof extends the sealing section S2; each sealing section is preferably substantially equal to one-half of the width of the flattened portions P.

Each of the sealing sections S1 and S2 for each container comprises what may, for convenience, be termed a primary sealing element P and a secondary sealing element E. Preferably, as shown in Figs. 1 and 2, the clamping tools 2 and 3 are constructed not only to flatten the tube to form adjacent sealing sections S1, S2, but also, because of their cooperating ridges and recessions 4, 5, concurrently to provide definite lines of fold between the primary and secondary seal elements P, E of each sealing section.

Because of the stiffness of the sealing sections arising from the several layers of material and their adhesive attachment, the primary and secondary sealing elements tend to remain set in the angular or partially folded relation imparted thereto by the clamping tools.

After each container in turn is cut from the web W or tube T, the secondary seal elements E are further folded and pressed throughout their length and width, specifically during application of heat, into adhesive engagement with the associated primary seal elements P, P, the final package C3 having the appearance shown in Fig. 3.

It is not essential that both secondary sealing operations, upon opposite ends of a container, be performed after severance of that container from the web; as apparent from Fig. 1, the secondary sealing operation upon the lower end of the endmost container C1 may be performed before severance of that container from the web.

Whether either or both of the secondary sealing operations upon the opposite ends of the container be performed after detachment of the container from the web, the secondary sealing operation is facilitated by the aforesaid preliminary or partial bending of the sections S1, S2 concurrently with the primary sealing operation, as previously described.

With the lines of fold between the primary and secondary sealing elements predetermined, it is a simple matter to bend each of the sealing sections S1, S2 into engagement with itself and apply heat and pressure thereto with assurance the containers will be effectively sealed, present a uniform appearance, and be of the same overall length.

Particularly when the web material is of a type comprising, coated with, or impregnated with a thermo-plastic substance, the application of heat and pressure to form a secondary seal actually resets, without first destroying, the primary seal. In the completed seal at each end of the package C3, Fig. 3, there are three adhesive welds or bonds each supplementing the other to minimize possibility of accidental rupture of the seal; one weld joins the inner faces of the two portions of web material comprising the primary seal element P; another weld joins the interior faces of the two portions of the web material comprising the secondary seal element E, and a third weld joins the engaging faces of the primary and secondary seal elements. Also, the turning over of the secondary seal tends to strengthen the seal of the package, all aside from the third weld just mentioned.

To facilitate formation of more complex seals, the faces of the tools which flatten the tube T may be provided with a larger number of projections and recesses, or otherwise suitably complementarily shaped; for example, as shown in Fig. 5, the clamping tool 2A may be provided with a ridge 6 for reception by recess 5 of tool 2A, with two recesses 8, 7 for receiving ridges 8, 9 of tool 2A and with two flats 10, 11 for coacting with the flats 12, 13 of tool 2A. As appears from Fig. 4, when the primary sealing tools are of this construction, there are produced during the flattening of the tube T, two lines of fold x, y in each of the sealing sections S1, S2.

Each of the sections S1, S2 may be folded once, as in Fig. 3, to form a secondary seal, and the resulting seal structure again folded to bring the exposed face of the seal element E, or of the seal element P, into adhesive attachment with the end of the package, Fig. 7, or preferably both of these folding operations and application of heat and pressure may be performed as one secondary sealing operation, generally as indicated in Fig. 6.

The feasibility of flattening the seals against the package depends upon the ability of the package contents to withstand the pressure and temperature incidental to the sealing operation.

Also as indicated in Fig. 6, the secondary sealing operation may be accompanied by a shaping operation; specifically, while the tools 14, 14 are applying heat and pressure to the ends of the package, the shaping tools 15, 15 are brought into engagement with the sides of the package, specifically to square it up; preferably, tools 15, 15 are also heated with the result the package, after withdrawal of the pressing tools, will tend to retain its shape because of setting of the thermo-plastic nature of the container material.

Each of the end seals in Figs. 6 and 7 comprises a primary element P whose width is approximately one-fourth of the total width of the sealing section S1 or S2 and whose lower face, Fig. 7, after the secondary sealing operation, is adhesively attached to the corresponding end of the package; the upper face of the primary element P is adhesively attached to the secondary sealing element E whose width is approximately twice that of the primary sealing element, so that, as appears in Fig. 7, the lower face of the right-hand end of the sealing element E is ad-

5/14

Plaintiff's Exhibit 5

hesively attached to the top of the container, the upper face of the right-hand end of the sealing element E is adhesively attached to the secondary sealing element EE. Each of the sealing elements is double-ply, because made from the flattened section of the tube of web material, and these two plies are adhesively joined during the primary sealing operation and remain joined before and after the secondary sealing operation. During the secondary sealing operation, all of these sealing elements are, in effect, welded into an integral whole.

For making thin packages suited for seeds, medicinal powders and the like, the web W, Fig. 8, is drawn over a narrow forming tube 1A, with the margins or edges of the web projecting outwardly beyond an edge of the forming tube where they are pressed into adhesive attachment with each other, as by a suitable heated tool or tools when the web is one of the aforesaid thermoplastic types, to form seal S3. As in the modification of Fig. 1, the resulting tube T1 is flattened at intervals P1 to divide it into a continuous series of containers, C6, C7, C8, etc. Specifically, referring to Fig. 8, the sealing operation which closes the upper end of container C7 concurrently effects closure of the bottom of container C8 whose upper end is in communication with the filling tube 1A. As will be understood from the prior description of Fig. 1, after container C8 is filled, the web is pulled downwardly and the tube T1 flattened to close the top of container C8 and to form the bottom of the next container. Each flattening operation effected upon the tube T1 produces sealing sections S4, S5 closing, respectively, the bottom of one container and the top of the previously formed container. These sealing sections S4, S5 may, as indicated in Fig. 1, comprise primary and secondary sealing elements or, as specifically shown in Figs. 8 and 9, the sealing sections S4, S5 of each package may comprise only primary sealing elements; i. e., they are not folded. Whether the sealing sections S4, S5 are folded or not, the seal S3 which, in this modification, also projects outwardly from the containers, may be folded upon itself, as indicated in Fig. 9, to effect adhesive attachment to each other of the primary and secondary sealing elements P, E. This secondary sealing operation may be effected after the heated containers are severed from the web, or before their severance but preferably after the flattening operation effected by tools 2, 3 or their equivalent.

As indicated in Fig. 10 the containers may be formed from two webs of flexible material; specifically, the webs W1, W2, drawn from the rolls R1, R2, are brought into tube-forming relation about the former tube 1, with the margins of the webs projecting outwardly or away from the former tube 1.

The adjacent overlying projections are adhesively attached, as by heated pressure rolls when the web is of thermo-plastic type, to form seals S6, S7, extending longitudinally of the tube T2 of container material. The tube T2 is progressively pressed and advanced as by heated clamping tools which flatten the tube to bring opposite interior faces into adhesive attachment at recurrent sections P, generally as in the modifications previously described.

Each container, after its severance from the web, has four seals projecting outwardly therefrom; the seals S8, S9 at two opposite ends are formed by two successive primary sealing operations, and the seals S6, S7 projecting from the other pair of opposite sides were produced, as previously described, during formation of closed tube T2 about the former tube 1. The sealing sections S8, S9 may, as in Fig. 1, each comprise a primary sealing element P and secondary sealing element E which are brought into adhesive attachment, or these elements may be simply primary seals.

Whether the sealing sections S8, S9 be plain or folded, the sealing sections S6, S7 may be folded, as indicated in Fig. 11, to bring the primary and secondary sealing elements P, E into adhesive attachment, and to facilitate this secondary sealing operation, each of the seals S6, S7 is preferably bent or partially folded, as indicated in Fig. 11, concurrently with joinder of the margins of the webs W1, W2 or at least before the package is severed from the tube T2.

In each of the foregoing modifications, the web is folded into a tube closed by a longitudinal seam before introduction of its contents and before the flattening of the tube to bring the interior faces of its opposite sides into adhesive attachment; in accordance with the method illustrated by Fig. 14, the web W3 is brought into tube-forming position but the tube T3 is maintained open longitudinally until after formation and filling of containers, as by a spacer structure 16, which may terminate in, near, or at a filling tube or hopper 17. The web, in advance of the filling station, is flattened at intervals, as by heated clamping tools, to form a series of containers or pockets C17, C18, etc., whose upper ends are open to receive their contents as each container, in turn, passes or momentarily pauses below the filling hopper 17 or equivalent. The feeding of the web and the production of the flattened sealing sections P may be performed by heating clamping tools generally of the type shown in preceding modifications; each flattened section provides seals S11, S12 for adjacent ends of contiguous containers.

As the tube T3 is fed beyond the hopper, it is closed, as by heated pressing tools which force the margins of the web into adhesive attachment with each other, so that the final folded sealed packages are the same as shown in Fig. 8. Each of the folded sealed containers, C18, Figs. 14, 17 and 18, after its detachment from the web by any suitable mechanism, has three projecting seals any one or all of which may be folded to provide a secondary seal. Specifically, the last formed seal S18 of each package is folded upon itself to bring the primary and secondary sealing elements PE into adhesive attachment with each other. This secondary sealing operation may be performed upon the packages after their severance from the strip, or may be performed before their detachment.

Specifically, however, and preferably, as indicated by Figs. 15–18, the sealing section S18 is formed by pressing the margins together and concurrently partially bending them, Figs. 15 and 17, and thereafter, and specifically after severance of the container from the web, the secondary sealing section E is further bent, Fig. 16, and then pressed, during application of heat, into adhesive attachment with the primary seal element P, Fig. 18, to effect the secondary sealing operation, affording a container similar to that shown in Fig. 9.

While I have illustrated and described preferred modifications, it is to be understood my invention is not limited thereto but is coextensive in scope with the appended claims.

Plaintiff's Exhibit 5

What I claim is:

1. The method of making, filling and sealing containers which comprises bringing flexible web material into tube-forming relation, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

2. The method of making, filling and sealing containers which comprises bringing thermo-plastic web material into tube-forming relation, during application of heat thereto pressing the web margins together and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom and comprising overlying areas of said web material joined by a thermo-plastic film, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

3. The method of making, filling and sealing containers which comprises joining the margins of flexible web material to form a tube, flattening the tube transversely at intervals to define containers and to provide therefor primary seals each of which closes adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and folding into adhesive attachment with itself at least one primary seal of each container to provide a secondary seal.

4. The method of making, filling and sealing containers which comprises pressing together, during application of heat thereto, the margins of thermo-plastic web material to form a tube, flattening the tube transversely at intervals to define containers and concurrently applying heat to the flattened tube sections to provide primary seals respectively closing adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube through the flattened sections to detach the filled and sealed containers, and folding into attachment with itself, during application of heat thereto, a primary seal of each container to provide a secondary seal.

5. The method of making, filling and sealing containers which comprises joining the margins of flexible web material to form a tube, flattening the tube transversely at intervals to define containers, to provide primary seals for the adjacent ends of contiguous containers and to define secondary seal elements, filling each of the containers in turn between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and pressing the secondary seal elements of each container into adhering engagement therewith.

6. The method of making, filling and sealing containers which comprises bringing flexible web material into tube-forming relation, joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of each of which project outwardly therefrom transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of the projecting seals of each container to provide a secondary seal.

7. The method of making, filling and sealing containers which comprises bringing thermo-plastic web material into tube-forming relation, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of each of which project outwardly therefrom and comprise overlying areas of said web material joined by a thermo-plastic film, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of the projecting seals of each container to provide a secondary seal.

8. The method of making, filling and sealing containers which comprises bringing flexible web material into tube-forming relation, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and applying pressure to each container to shape it and concurrently to fold each of said seals into adhesive attachment with itself to form a secondary seal.

9. The method of making, filling and sealing containers which comprises bringing thermo-plastic web material into tube-forming relation, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof and comprising overlying areas of said web material joined by a thermo-plastic film, during their formation bending said seals intermediate their ends, transversely severing the tube across the flattened portions to detach the sealed containers, filling the containers before their detachment, applying pressures to sides of each container to shape it and further to bend said seals, and concurrently with said application of pressure, applying heat to unite the bent portions of each of the seals to provide a secondary seal.

10. The method of making, filling and sealing containers which comprises bringing flexible web material into tube-forming relation, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, concurrently with flattening of a section of the tube bending it along several substantially parallel lines spaced longitudinally of the tube to define primary and secondary sealing elements for adjacent containers, transversely severing the tube between secondary seal elements of each flattened section to detach the sealed containers, and pressing each of the secondary seal elements into adhesive attachment with the associated primary seal element.

11. The method of making, filling and sealing containers which comprises bringing flexible web material into tube-forming relation, presalt marginal sections of the web material into ad-

5/16

hesive attachment to provide a seal, at intervals pressing transverse sections of the interior faces of the tube wall into adhesive attachment with each other to form a seal, concurrently with one of said pressing operations bending the seal produced thereby to define primary and secondary seal elements, transversely severing the tube across said transverse sections to detach sealed filled containers, and pressing the secondary seal elements into adhesive engagement with the associated primary seal elements.

12. The method of making, filling and sealing containers which comprises forming a tube from a web of flexible sheet material whose width is suitably greater than the perimeter of the tube, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

13. The method of making, filling and sealing containers which comprises forming a tube from a plurality of webs of flexible sheet material whose combined width is suitably greater than the perimeter of the tube, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

14. The method of making, filling and sealing containers which comprises forming a tube from a web of thermo-plastic sheet material whose width is suitably greater than the perimeter of the tube, during application of heat thereto pressing the web margins together and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom and comprising overlying areas of said web material joined by a thermo-plastic film, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

15. The method of making, filling and sealing containers which comprises forming a tube from a plurality of webs of thermo-plastic sheet material whose combined width is suitably greater than the perimeter of the tube, during application of heat thereto pressing the web margins together and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom and comprising overlying areas of said web material joined by a thermo-plastic film, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of said projecting seals of each container to provide a secondary seal.

16. The method of making, filling and sealing containers which comprises joining the margins of a web of flexible material to form a tube, flattening the tube transversely at intervals to define containers and to provide therefor primary seals each of which closes adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and folding into adhesive attachment with itself at least one primary seal of each container to provide a secondary seal.

17. The method of making, filling and sealing containers which comprises joining the adjacent margins of a plurality of webs of flexible material to form a tube whose perimeter is greater than the width of any one of said webs, flattening the tube transversely at intervals to define containers and to provide therefor primary seals each of which closes adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and folding into adhesive attachment with itself at least one primary seal of each container to provide a secondary seal.

18. The method of making, filling and sealing containers which comprises pressing together, during application of heat thereto, the margins of a web of thermo-plastic material to form a tube, flattening the tube transversely at intervals to define containers and concurrently applying heat to the flattened tube sections to provide primary seals respectively closing adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube through the flattened sections to detach the filled and sealed containers, and folding into attachment with itself, during application of heat thereto, a primary seal of each containers to provide a secondary seal.

19. The method of making, filling and sealing containers which comprises pressing together, during application of heat thereto, the adjacent margins of a plurality of webs of thermo-plastic material to form a tube whose perimeter is greater than the width of any one of said webs, flattening the tube transversely at intervals to define containers and concurrently applying heat to the flattened tube sections to provide primary seals respectively closing adjacent ends of contiguous containers, filling the containers between successive tube-flattening operations, transversely severing the tube through the flattened sections to detach the filled and sealed containers, and folding into attachment with itself, during application of heat thereto, a primary seal of each container to provide a secondary seal.

20. The method of making, filling and sealing containers which comprises joining the margins of a web of flexible material to form a tube, flattening the tube transversely at intervals to define containers, to provide primary seals for the adjacent ends of contiguous containers and to define secondary seal elements, filling each of the containers in turn between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and pressing the secondary seal elements of each container into adhering engagement therewith.

21. The method of making, filling and sealing containers which comprises joining the adjacent margins of a plurality of webs to form a tube whose perimeter is greater than the width

one of said webs, flattening the tube transversely at intervals to define containers, to provide primary seals for the adjacent ends of contiguous containers and to define secondary seal elements, filling each of the containers in turn between successive tube-flattening operations, transversely severing the tube across the flattened portions thereof to detach the filled and sealed containers, and pressing the secondary seal elements of each container into adhering engagement therewith.

22. The method of making, filling and sealing containers which comprises shaping a web of flexible material in the form of a tube, joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of each of which project outwardly therefrom, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of the projecting seals of each containers to provide a secondary seal.

23. The method of making, filling and sealing containers which comprises forming from a plurality of webs a tube whose perimeter is greater than the width of any one of the webs, joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of which project outwardly therefrom, transversely severing the tube across the flattened sections thereof to detach the sealed containers, filling the containers before their detachment, and folding into adhesive attachment with itself at least one of the projecting seals of each container to provide a secondary seal.

24. The method of making, filling and sealing containers which comprises shaping a web of flexible thermo-plastic material into the form of a tube, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of each of which project outwardly therefrom and comprises overlying areas of said web-material joined by a thermo-plastic film, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of the projecting seals of each container to provide a secondary seal.

25. The method of making, filling and sealing containers which comprises forming from a plurality of webs of flexible thermo-plastic material a tube whose perimeter is greater than the width of any one of the webs, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers all of the seals of each of which project outwardly therefrom and comprise overlying areas of said web-material joined by a thermo-plastic film, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and during application of heat, folding into attachment with itself at least one of the projecting seals of each container to provide a secondary seal.

26. The method of making, filling and sealing containers which comprises forming a tube from a web of flexible material, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and applying pressure to each container to shape it and concurrently to fold each of said seals into adhesive attachment with itself to form a secondary seal.

27. The method of making, filling and sealing containers which comprises forming from a plurality of webs of flexible material a tube whose perimeter is greater than the width of any one of said webs, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof, transversely severing the tube across the flattened sections to detach the sealed containers, filling the containers before their detachment, and applying pressure to each container to shape it and concurrently to fold each of said seals into adhesive attachment with itself to form a secondary seal.

28. The method of making, filling and sealing containers which comprises forming a tube from a web of flexible thermo-plastic material, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof and comprising overlying areas of said web material joined by a thermo-plastic film, during their formation bending said seals intermediate their ends, transversely severing the tube across the flattened portions to detach the sealed containers, filling the containers before their detachment, applying pressure to sides of each container to shape it and further to bend said seals, and concurrently with said application of pressure, applying heat to unite the bent portions of each of the seals to provide a secondary seal.

29. The method of making, filling and sealing containers which comprises forming from a plurality of webs of thermo-plastic material a tube whose perimeter is greater than the width of any one of said webs, during application of heat thereto joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals projecting away from opposite sides of the sealed interior thereof and comprising overlying areas of said web material joined by a thermo-plastic film, during their formation bending said seals intermediate their ends, transversely severing the tube across the flattened portions to detach the sealed containers, filling the containers before their detachment, applying pressure to sides of each container to shape it and further to bend said seals, and concurrently with said application of pressure, applying heat to unite the bent portions of each of the seals to provide a secondary seal.

30. The method of making, filling and sealing containers which comprises forming a tube from a web of flexible material, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, concurrently with flattening of a section of the tube bending it along several substantially parallel lines spaced longitudinally of the tube to define primary and secondary sealing elements for adjacent containers, transversely severing the tube between secondary seal elements of each flattened section to detach the sealed containers, and pressing each of the secondary seal elements into adhesive at-

Plaintiff's Exhibit 5

tachment with the associated primary seal element.

31. The method of making, filling and sealing containers which comprises forming from a plurality of webs of flexible material a tube whose perimeter is greater than the width of any one of said webs, joining the web margins and flattening the tube transversely at intervals to form sealed containers each having seals outwardly projecting therefrom, concurrently with flattening of a section of the tube bending it along several substantially parallel lines spaced longitudinally of the tube to define primary and secondary sealing elements for adjacent containers, transversely severing the tube between secondary seal elements of each flattened section to detach the sealed containers, and pressing each of the secondary seal elements into adhesive attachment with the associated primary seal element.

32. The method of making, filling and sealing containers which comprises forming a tube from a web of flexible material, pressing marginal sections of the web material into adhesive attachment to provide a seal, at intervals pressing transverse sections of the interior faces of the tube wall into adhesive attachment with each other to form a seal, concurrently with one of said pressing operations bending the seal produced thereby to define primary and secondary seal elements, transversely severing the tube across said transverse sections to detach sealed filled containers, and pressing the secondary seal elements into adhesive engagement with the associated primary seal elements.

33. The method of making, filling and sealing containers which comprises forming from a plurality of webs of flexible material a tube whose perimeter is greater than the width of any of the webs, pressing marginal sections of the web material into adhesive attachment to provide a seal, at intervals pressing transverse sections of the interior faces of the tube wall into adhesive attachment with each other to form a seal, concurrently with one of said pressing operations bending the seal produced thereby to define primary and secondary seal elements, transversely severing the tube across said transverse sections to detach sealed filled containers, and pressing the secondary seal elements into adhesive engagement with the associated primary seal elements.

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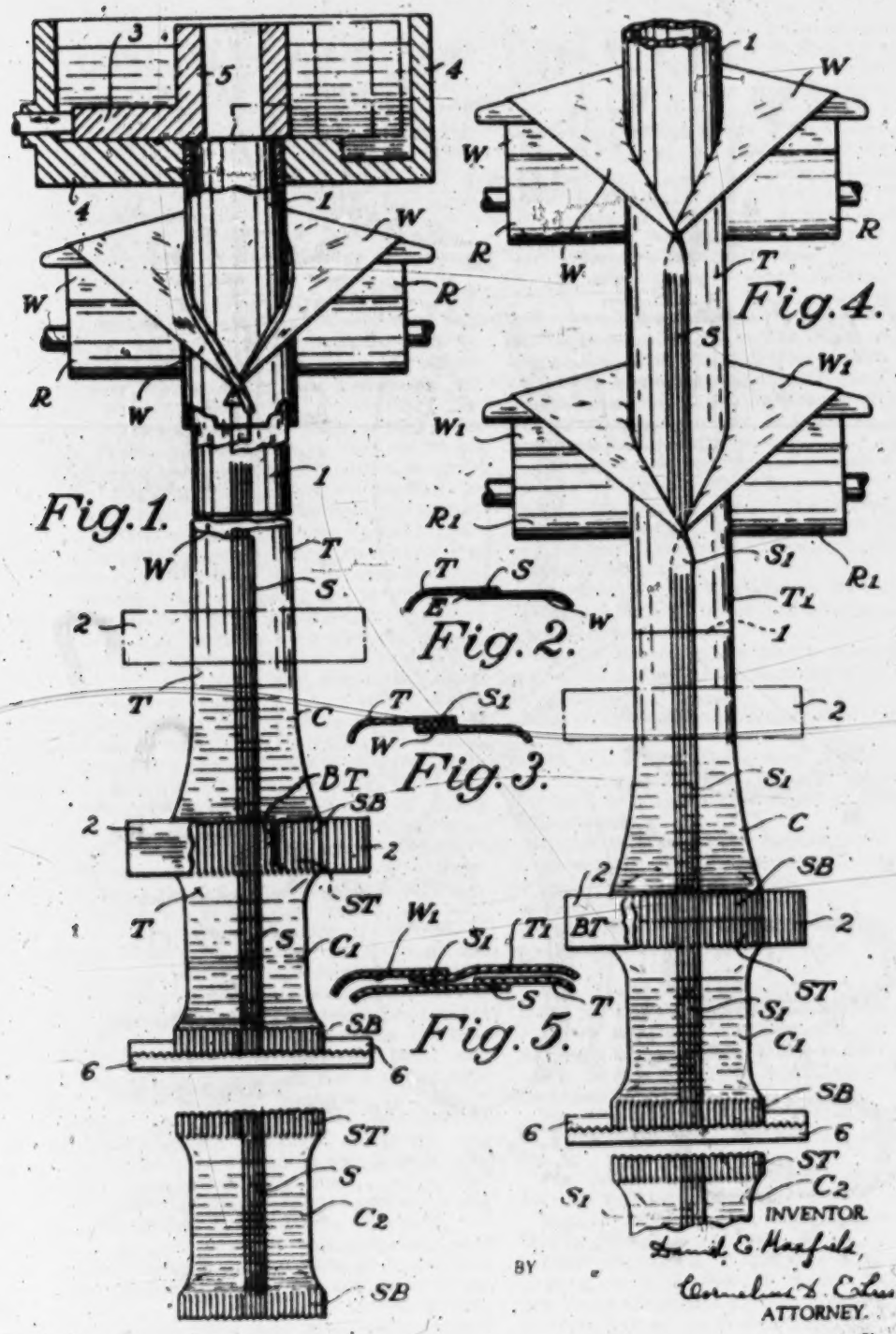
5/19

Plaintiff's Exhibit 5

April 18, 1939. D. E. MAXFIELD 2,154,521

METHOD OF MANUFACTURE OF FILLED CONTAINERS

Filed Feb. 15, 1938 2 Sheets-Sheet 1



Plaintiff's Exhibit 5.

April 18, 1939. D. E. MAXFIELD 2,154,521

METHOD OF MANUFACTURE OF FILLED CONTAINERS

Filed Feb. 15, 1938 2 Sheets-Sheet 2

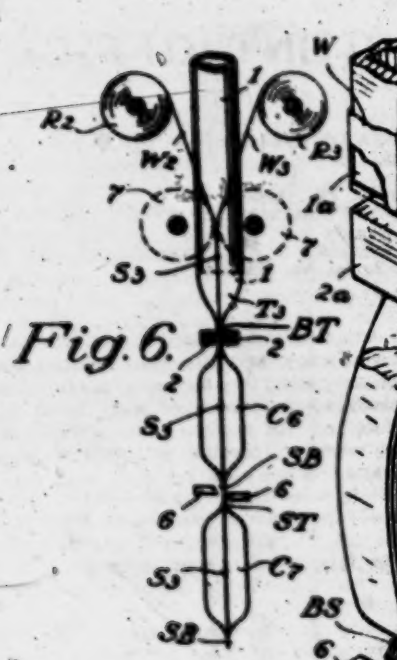


Fig. 6.

Fig. 9.

Fig. 11.

Fig. 13.

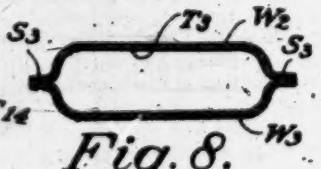


Fig. 8.

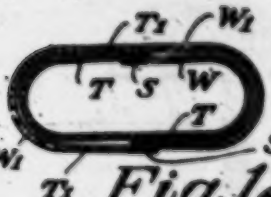


Fig. 12.

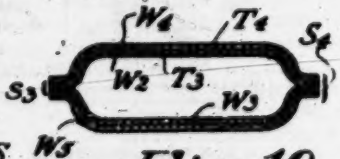


Fig. 10.

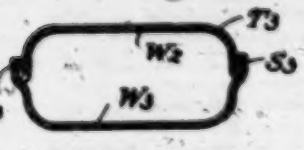


Fig. 7.

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5/28

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Patented Apr. 18, 1939 2,154,521

UNITED STATES PATENT OFFICE

2,154,521

METHOD OF MANUFACTURE OF FILLED CONTAINERS

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application February 15, 1938, Serial No. 190,569

13 Claims. (Cl. 93—3)

My invention relates to the manufacture, filling and sealing of containers formed of one or more webs of flexible material, such as paper, paper board, cloth, metal foil, Cellophane, or the like.

In accordance with my invention, one or more webs of flexible material having, because of its composition or because of impregnation or coating, the characteristics of imperviousness to liquid and plastic or adhesive when subjected to heat, is or are brought into tube-forming relation; by application of heat and pressure to the web margins and to longitudinally spaced transverse portions of the tube, there is formed a series of containers in succession detached from the webbing after each has been filled with liquid and sealed by application of heat and pressure.

Further in accordance with my invention, a multi-ply package suited for liquid or non-liquid filling comprises an inner tube formed of a web element whose longitudinal margins are joined, or is formed of a plurality of web elements having their longitudinal margins joined to form a composite tube circumference, and, in either case, there is formed around the inner tube, either simultaneously with or after the joinder of the margins of the webbing of the inner tube, at least one outer tube likewise formed of marginally joined web or web components.

Further, when the container is formed of single-ply webbing, regardless of nature of the filling, the web material is preferably cloth, impregnated with one or more materials resistant to moisture and plastic when heated, or is metal foil coated on one side with suitable thermo-plastic material and covered on the other side with paper whose exposed surface is coated with a suitable thermo-plastic material.

Further, when the package or container is formed of multi-ply individual webs, the web destined to form the outside of the package may be cloth impregnated with one or more substances imparting thereto thermo-plasticity and any other desired characteristic, especially resistance to moisture; the web material, with which the contents of the package comes into contact, may be a moisture-resistant material, such as "Diafane" which is also thermo-plastic, and, if desired, there may be an intermediate web, or paper for example, having a thermo-plastic coating.

Further, for multi-ply packages, the web destined to form the outside of the package may be heavy paper, craft paper for example, having thereon a thermo-plastic coating, at least on the areas which are subsequently to form the seals of the package, and the web material destined to contact with the contents of the package, especially when to be filled with liquid, may be "Pliofilm" or like material which itself, without impregnation or coating, is liquid or moisture-proof and thermo-plastic.

Further, a package may be formed of a single composite web comprising two or more layers of thermo-plastic paper, between any pair of which may be interposed one or more plies of fabric of open mesh, bonded to the paper by a moisture-resistant material.

My invention further resides in the methods of manufacture of filled containers hereinafter described and claimed.

For an understanding of my invention reference is to be had to the accompanying drawings, in which:

Fig. 1 illustrates the progressive formation of packages from web material;

Fig. 2 is a sectional view of a seal formed by overlapping margins of the web material;

Fig. 3 is a sectional view of a modified seal construction;

Fig. 4 illustrates the formation of packages from several webs of flexible material;

Fig. 5 is a sectional view of the seals of a multi-ply package;

Fig. 6 illustrates a method of forming single-ply containers from two webs of flexible material;

Figs. 7 and 8 are sectional views of packages made in accordance with the method of Fig. 6;

Fig. 9 illustrates the formation of multi-ply packages by a method similar to that of Fig. 6;

Fig. 10 is a section of a package made in accordance with the method of Fig. 9;

Fig. 11 is a perspective view of a package made in accordance with the method of Fig. 6 or Fig. 9;

Fig. 12 is a cross-sectional view of another form of multi-ply package;

Fig. 13 in perspective illustrates a modification of preceding methods.

Referring to Fig. 1, the web W is generically illustrative of a web of flexible material impregnated or coated with a substance such as a suitable wax or resin, rendering it impervious to liquid and plastic under heat, or of some substance such as moisture-proof Cellophane, "Pliofilm" or the like, which itself, without impregnation or coating, has those characteristics. Specifically, the web W may be of cloth impregnated with a resin or wax, or a suitably heavy paper,

9/12

such as craft paper, coated with a resin or wax, or metal foil for example, aluminum foil, lead foil or the like, backed with paper and having a coating of thermo-plastic material on the exposed faces of the foil and paper, or it may be a composite web formed by bonding together, with a suitable moisture-resistant material such as a resin or wax, two layers of paper coated with a thermo-plastic, and between which is disposed one or more plies of fabric of open mesh.

The web W is drawn from the roll R thereof over the forming tube I of suitable size and shape, and the overlapping margins of the web are pressed against each other with concurrent application of heat to provide a seal S extending longitudinally of the tube T formed by the web on and below the forming tube I. Mechanism suited to feed the web W and to form the sealed tube T therefrom is disclosed in Zwoyer Patent #1,966,422. Below the lower end of the forming tube I, the tube T of web material is flattened, as by suitable heated clamping tools 2, to unite the inner faces of the opposite sides of the flattened tube walls thus to form a sealing section ST including a seal SB for the bottom of a liquid-tight container C whose upper open end embraces the forming tube I which is hollow to permit introduction of the liquid contents or filling of the partially formed container C.

Specifically, after the bottom of container C is closed by its seal SB and while its upper end is still open, the slide 3 in the reservoir 4 moves to the position shown in Fig. 1 to discharge into the container through the forming tube I a predetermined amount of liquid. When the slide 3 moves to the right from the position shown in Fig. 1 to the dotted line position, the open-ended receptacle 5 thereof receives a further charge of liquid from the reservoir in which the level of liquid may be maintained substantially constant by a suitable means not shown. The particular mechanism shown for delivering a predetermined amount of liquid to each container as it in turn is in the position of container C, Fig. 1, is per se no part of the present invention and may be replaced by any other suitable known arrangement.

After each container in turn has been filled with liquid, the heated clamping tools, 2, 2, or equivalent, are moved from their full line position, Fig. 1, to their dotted line position again to flatten the tube T and form a seal SB closing the bottom of the next container to be filled and concurrently forming the seal ST closing the top of and completing the closure of the container just filled. The tools 2, 2 in moving downwardly from the dotted line position to the full line position draw further web material over the forming tube I to form another section of tube T, and the container which has just been filled is moved downwardly to the position of the filled, sealed contained C1 of Fig. 1.

The operations of filling the container, of flattening the tube T to seal a filled container and concurrently to form the bottom of the next container to be filled, and of feeding the web material are repeated to form from the web W a series of liquid-filled containers or packages each of which, after filling and complete sealing thereof, is detached from the tube T as by a suitable knife structure 6 which, transversely severs a flattened sealing portion ST of the tube to divide it into the aforesaid bottom seal SB for one container C1 and the top seal ST of the previously filled container C2.

When the margins of the web W are brought into the simple overlapping relation described in connection with Fig. 1, the edge E of one of the margins is, as more apparent from Fig. 2, in direct contact with the liquid contents of the package. If the web material is not of itself impervious to moisture, this simple form of seal is not suited for many liquids because the ends of the web fibers exposed at edge E serve as wicks which by capillary attraction cause the liquid to penetrate the web and adversely affect its strength. This difficulty, inherent in coated or impregnated webbing, is overcome by the seal construction S1 shown in Fig. 3; in this modification, the margins of the web are brought into face-to-face sealing engagement with both edges of the web exteriorly of the package and therefore out of contact with its liquid contents; the upstanding flap or flange so formed may, for better appearance and greater strength, be turned back, as shown in Fig. 3, into adhesive engagement with the outer face of the package.

When for additional strength, to meet conditions imposed by the particular nature of the package contents, or to meet other requirements arbitrarily imposed, the package is required to be of multi-ply construction, the method illustrated in Fig. 4 may be employed. As there appears, in manner similar to that described in connection with Fig. 1, a tube T is formed from a web of material W, but, unlike Fig. 1, before the tubing T passes beyond the forming tube I, there is formed thereover a second tube T1 from a web W1. Preferably, the overlapping margins of web W are pressed together to form the longitudinal seal S before the tube T reaches the point where it is surrounded by the tube T1 but this is not essential and the formation of the seal S of tube T may be effected concurrently with the formation of the longitudinal seal S1 of the outer tube T1, in which event if both surfaces of both webs are plastic when subjected to heat, the inner and outer tubes are adhesively joined together longitudinally of their seams S and S1. Preferably, the seam S of the inner tube T is staggered with respect to the seam S1 of the outer tube T1 generally as shown in Fig. 5, or in Fig. 12. From this stage on, the steps of filling and closing the containers and of detaching the filled and closed containers are the same as previously described in connection with Fig. 1. From Fig. 4 it is apparent that by use of additional webs, a container having any desired number of plies may be formed; each web, during the manufacture of the containers, forms a tube nesting with the tubes formed from the other webs.

When the package is of multi-ply construction, it is not essential that all of the plies be of material which is impervious to moisture; the ply in contact with the liquid should be of that nature, but the next ply may be of material selected for strength; and a third ply, if used, may be selected principally for the enhanced appearance it may afford. As typical of desirable construction for multi-ply packages, the web W, Fig. 4, may be moisture-proof Cellophane, "Diafane", "Pliofilm", "Parafilm", or like material impervious to moisture and plastic under heat, and web W1 may be suitably heavy paper impregnated or coated with a suitable theremo-plastic material. Moisture-proof packages of this type, and of other multi-ply types herein described, are suited not only for liquids, but also for solids, such as coffee, sugar, or the like, which, when packaged, should be prevented from losing moisture

5/23

or absorbing moisture from the atmosphere.

In the modification shown in Fig. 6, the tube of web material which is flattened to form a series of packages comprises two webs W2, W3, which are drawn from rolls R2, R3 over forming tube 1 of suitable size and shape, the margins of the webs projecting outwardly from the forming tube 1 on opposite sides thereof. The web margins are caused to adhere to each other, as by the heated rolls 7, 7, to form longitudinal seals S3 projecting outwardly from opposite sides of the tube T3 of web material, Fig. 8. The circumference of tube T3 is composite; it is formed in part by web W2, and in part by web W3 joined to web W2 at their longitudinal margins.

Below the lower open end of the forming tube 1 the tube T3 is flattened, as in the methods previously described, to provide a flattened seal section BT the upper part SB of which effects closure of the bottom of a container about to be filled and whose lower part ST closes a previously formed and filled container. After each container is filled with its contents, the tube T3 is pulled downwardly, as by the heated clamping tools 7, 7, to draw further web material from the rolls R2, R3, about the forming tube 1 and thereafter the tube is flattened above the filling to complete the formation of one package and to close the bottom of the next. Each package, in turn, is detached from the webbing or tube T3, as by the knives 8, to form a complete filled and sealed package having the appearance of package C8, Fig. 11, or, if desired, the seal flaps S3 may be flattened against and joined to the outside of the package, Fig. 7. By this method there is formed a single-ply container from two webs of web material which, because of its composition or prior treatment, is impervious to moisture and plastic when subjected to heat. Specifically, one or both of the webs W2, W3 may be cloth impregnated with one or more substances resistant to moisture and plastic when heated, or one or both of webs W2, W3 may be metal foil coated at least on its outer surface with a heat-sealing material and preferably to the other surface of which is suitably attached paper having on its exposed surface a suitable heat-sealing material; or one or both of the webs W2, W3 may be of a composite nature and consist, for example, of two plies of heat-sealing paper between which is disposed a fabric of open mesh bonded to the two paper layers by a suitable moisture-resistant material.

For making multi-ply packages of generally similar construction, and affording a final product having the same appearance as package C8 of Fig. 11, the method of Fig. 9 may be employed. The tube T3 formed from webs W2, W3, generally as described in connection with Fig. 6, is before it passes beyond the forming tube 1, nested within a tube T4 similarly formed by webs W4, W5, drawn from the rolls R4, R5. The relation between the margins of the webs is apparent from Fig. 10; specifically, the seals S3 formed by joinder of the margins of the webs W2, W3, when subjected to heat and pressure applied by the two pairs of rolls 7, are included within the total seal S4 formed when the margins of webs W4 and W5 are pressed, as by the pairs of heated rolls 7a, into adhesive attachment with the outer faces of the web margins forming the seal S3.

Each container, as will be understood from previous discussion herein of other methods, assumes the positions of containers C9, C10, C11, Fig. 9) as it is progressively formed, filled, sealed and detached from the webbing. None of the edges of the webbing is in contact with the liquid contents of the package and there is, therefore, no possibility of the liquid entering any of the webs by capillary attraction.

Any desired number of plies can be obtained by using additional pairs of rolls of web material to form one or more other tubes nesting with those of Fig. 9.

For the multi-ply construction, the webs forming the various plies may be of material identical in character or composition or the successive pairs of webs may be of different material; specifically, the webs W2, W3 destined to contact with the liquid contents of the packages, may be of moisture-proof Celiophane, "Diafane", "Pliofilm", or the like, and the webs W4, W5 may be of cloth impregnated with material resistant to moisture and heat-plastic.

When it is desired the completed packages shall be in the form of closed bags rather than of the pillow or wafer shapes of Figs. 1 and 11, the forming tube 1a is of polygonal cross-section, preferably rectangular as indicated in Fig. 13, and the clamping or heat-forming tools 2a, of suitable shape, engage the tube T8, formed from the web material as hereinbefore described, immediately below the end of forming tube 1a, after suitable tools, not shown, have produced longitudinal folds in the narrow sides of the tube T8. When the heated clamping tools 2a flatten and seal the tube T8, there is formed a gusset fold at the bottom corners of a bag or container C12, and simultaneously the top of the previously formed and filled bag C13 is sealed with the tucked-in sides sealed between the flattened sides. The tools 2, 2 in moving together are also effective to square the bottom of the bag with respect to its sides. Flattening of the tube T8 by the tools 2a produces across the bottom of a bag C12 a liquid-tight seal B8 with the edges of the web material out of contact with the contents of the bag or package, and concurrently forms across the top of a filled bag a liquid-tight seal T8; each flattened section BT of tube T8 comprising adjacent sealing sections BS, T8 is subsequently divided, as by the knives 8, 8, to detach a filled bag from tube T8.

If desired, the bottom seal B8 of each package may be turned upwardly, as indicated in Fig. 13, into adhesive engagement with the bottom of the bag. The tube T8 may be formed by any of the methods previously described to obtain either a single-ply or multi-ply construction, as may be desired; and the web material utilized to form the tube T8 may be of any of the preferred materials previously specifically mentioned.

Each completed package has the appearance of package C14, Fig. 13.

For brevity the term "thermo-plastic" shall be understood to relate to the surface characteristics of the web or film, whether it itself consists of thermo-plastic material, or is a non-thermo-plastic material either impregnated with thermo-plastic material or coated therewith on either or both sides.

While preferred methods and products have been specifically described and illustrated, it is to be understood my invention is not limited thereto, but is coextensive in scope with the appended claims.

What I claim is:

1. The method of manufacturing multi-ply liquid-filled containers which comprises forming nested tubes from a plurality of webs of flexible thermo-plastic material, at least the inner tube

impervious to liquid, during application of heat joining the web margins and flattening the nested tubes transversely at intervals to form sealed liquid-tight containers, filling each container with liquid, and transversely severing the nested tubes at the flattened sections to detach the multi-ply sealed liquid-filled containers therefrom.

2. The method of manufacturing multi-ply containers which comprises forming nested tubes from a plurality of webs of flexible thermo-plastic material, during application of heat joining the web margins and flattening the nested tubes transversely at intervals to form sealed containers, filling each container, and transversely severing the nested tubes at the flattened sections to detach the multi-ply sealed filled containers.

3. The method of manufacturing multi-ply moisture-proof containers which comprises forming nested tubes from a plurality of webs of thermo-plastic material, at least one tube impervious to moisture, during application of heat joining the web margins and flattening the nested tubes transversely at intervals to form multi-ply sealed containers, filling each container before final sealing thereof, and transversely severing the nested tubes at the flattened sections thereof to detach the multi-ply moisture-proof filled containers.

4. The method of manufacturing liquid-filled containers which comprises, during application of heat, joining the margins of a web of thermo-plastic moisture-resistant material to form a tube, during application of heat flattening the tube to form a container open at one end, introducing liquid into the container through the open end thereof, during application of heat flattening the tube above the liquid filling to form a sealed liquid-filled container, and transversely severing the flattened section of the tube above the liquid to detach the sealed liquid-filled container therefrom.

5. The method of manufacturing liquid-filled containers which comprises, during application of heat, joining the margins of thermo-plastic moisture-resistant web material to form a tube with all web edges exterior to the tube, during application of heat flattening the tube to form a container open at one end, introducing liquid into the container through the open end thereof, during application of heat flattening the tube above the liquid filling to form a sealed liquid-filled container, and transversely severing the flattened section of the tube above the liquid to detach the sealed liquid-filled container therefrom.

6. The method of manufacturing multi-ply containers which comprises, during application of heat, joining the margins of thermo-plastic web material to form a tube, forming a second tube about the first tube by joining the margins of at least one additional web during application of heat flattening the tubes to form a multi-ply container open at one end, filling the container through the open end thereof, during application of heat flattening the multi-ply tube above the liquid filling to form a sealed filled container, and transversely severing the flattened section of the composite tube above the liquid to detach the sealed filled container therefrom.

7. The method of manufacturing, filling and sealing containers which comprises joining the margins of thermo-plastic web material to form a [illegible] tube, tucking in one pair of sides of the tube, during application of heat pressing together other sides of the tube to form a container with a squared sealed end and an open end, filling the container through the open end, tucking in said pair of sides of the tube about the container contents, during application of heat pressing together said other sides of the tube above the container contents to complete the sealing of the filled container, and severing the tube to detach the sealed filled container.

8. The method of manufacturing multi-ply containers which comprises, during application of heat, joining the margins of thermo-plastic web material to form an inner tube with longitudinal seams corresponding in number to the number of webs, joining the margins of at least one additional web to form about the inner tube a second seamed tube, staggering the seams of the nested tubes, flattening the nested tubes transversely at intervals to form sealed containers, filling each container, and severing the nested tubes at their flattened sections to detach the multi-ply sealed filled containers.

9. The method of manufacturing liquid-filled containers which comprises applying heat and pressure to flatten an empty section of a tube formed of thermo-plastic web material impervious to liquid and to form a flattened seal section, pulling the flattened seal section to draw from a supply thereof sufficient web material to form a container, introducing liquid into said tube above said flattened seal section, applying heat and pressure to flatten the tube above said liquid and to form a flattened seal section, and severing the web material through said flattened seal sections to detach a liquid-filled container therefrom.

10. The method of manufacturing liquid-filled containers which comprises applying heat and pressure to form flattened seal sections spaced along a tube of thermo-plastic web material impervious to liquid, intermittently feeding the web material by pulling each seal section in turn to draw from a supply thereof sufficient web material to form a container, severing the web material through said seal sections to detach liquid-filled containers therefrom, and in the interval between formation of successive seal sections introducing liquid into the tube above the first-formed of said successive seal sections.

11. The method of manufacturing liquid-filled containers which comprises forming a strong, liquid-impervious tube by applying heat and pressure to join the margins of a strip of cloth treated with thermo-plastic material, during application of heat flattening the tube to form a container open at one end, introducing liquid into the container through the open end thereof, during application of heat flattening the tube above the liquid filling to form a sealed liquid-filled container, and transversely severing the flattened section of the tube above the liquid to detach the sealed liquid-filled container therefrom.

12. The method of manufacturing liquid-filled containers which comprises forming a strong, liquid-impervious tube by applying heat and pressure to join the margins of a paper web coated with thermo-plastic material, during application of heat flattening the tube to form a container open at one end, introducing liquid into the container through the open end thereof, during application of heat flattening the tube above the liquid filling to form a sealed liquid-filled container, and transversely severing the

Plaintiff's Exhibit 5

flattened section of the tube above the liquid to detach the sealed liquid-filled container therefrom.

13. The method of manufacturing liquid-filled containers which comprises applying heat and pressure to join the margins of liquid-impervious thermo-plastic web material to form a tube, forming a second tube about the first tube by joining the margins of a strong thermo-plastic web, during application of heat flattening the tubes to form a multi-ply container open at one end and whose plies are thermo-plastically joined at the flattened seal section of the other end, filling the container with liquid through the open end thereof, during application of heat flattening the tube above the liquid filling thermo-plastically to join the plies at said other end and to form a sealed-filled container, and transversely severing the flattened seal section of the composite tube above the liquid to detach the sealed filled container therefrom.

DANIEL E. MAXFIELD.

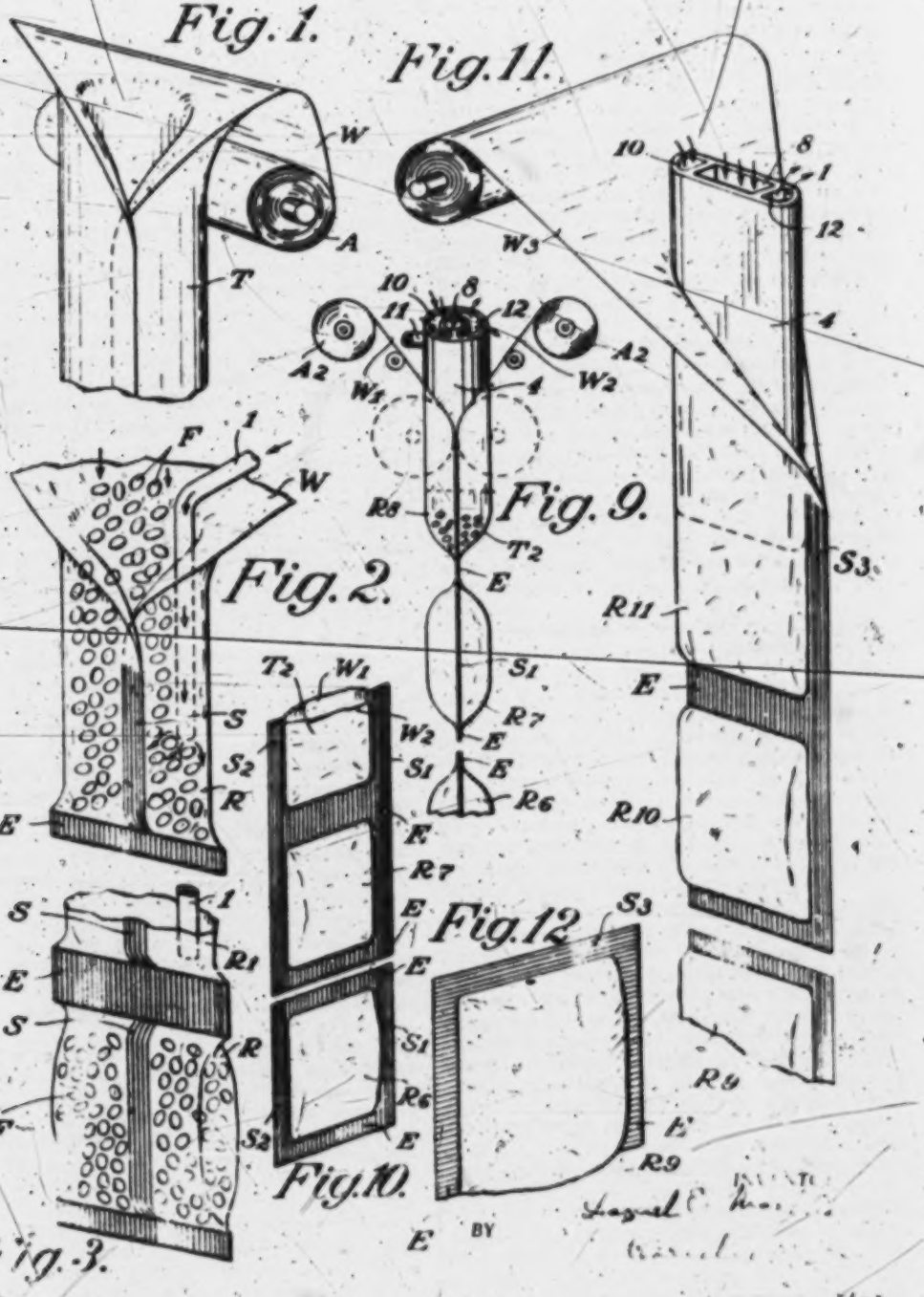
5/26

Plaintiff's Exhibit 5

May 30, 1939. D. E. MAXFIELD 2,160,367

METHOD OF MAKING SEALED PACKAGES

Filed Nov. 27, 1937 2 Sheets-Sheet 1



Inventor

BY

Attorney

5/33

Plaintiff's Exhibit 5

May 30, 1939. D. E. MAXFIELD 2,160,367

METHOD OF MAKING SEALED PACKAGES

Filed Nov. 27, 1937 2 Sheets-Sheet 2

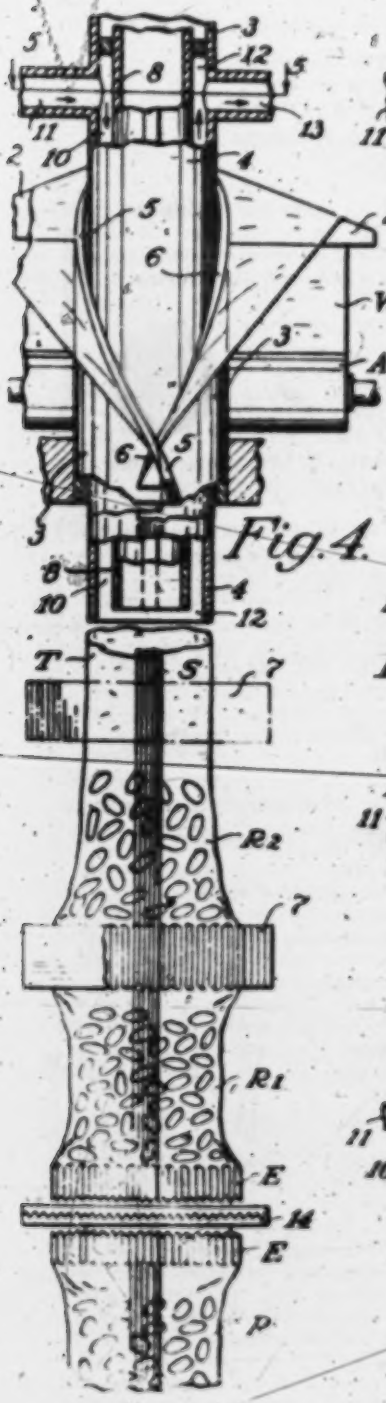


Fig. 4.

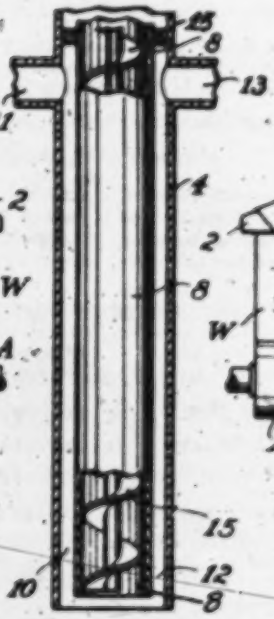


Fig. 6.

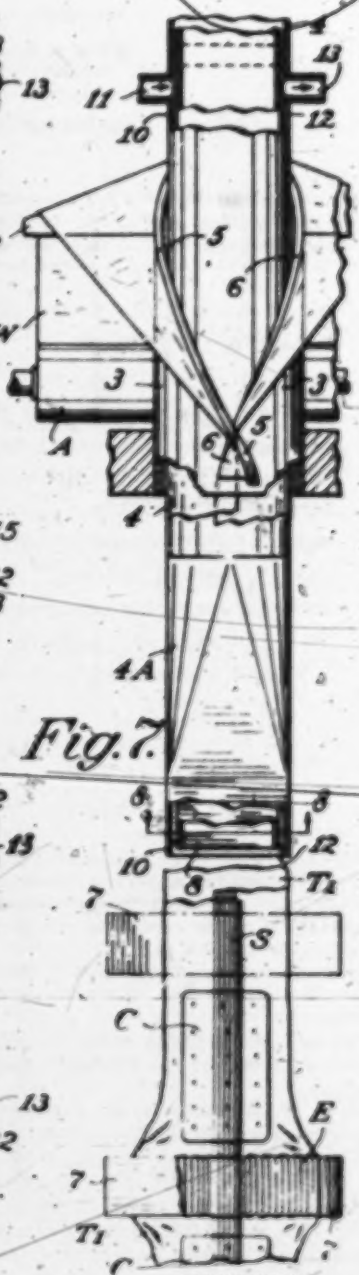


Fig. 7.

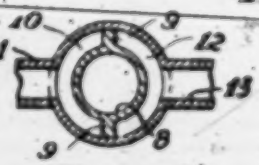


Fig. 5.

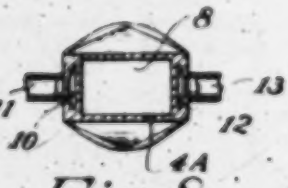


Fig. 8.

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Plaintiff's Exhibit 5

Patented May 30, 1939 2,160,367

UNITED STATES PATENT OFFICE

2,160,367

METHOD OF MAKING SEALED PACKAGES

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application November 27, 1937, Serial No. 176,815

3 Claims. (Cl. 93—3)

My invention relates to methods of making, filling and sealing containers to form sealed packages, and particularly to methods of making, [illegible] containers for vari-

Fig. 8 is a plan view in section, taken on line 8—8 of Fig. 7.

Figs. 9 and 10 illustrate another mode of making, filling and sealing a container using two webs

CERTIFICATE OF CORRECTION.

Patent No. 2,160,367. May 30, 1939.

DANIEL E. MAXFIELD.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, line 2, and in the heading to the printed specification, address of assignee, after "Summerdale," insert --Philadelphia,--; as shown by the record of assignments in this office; page 1, first column, line 44, strike out the word "in" before "addition"; page 3, second column, line 41, claim 2, after "form" insert --from--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of January, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

[illegible] previously introduced [illegible] receptacle during its formation, which additional gas or vapor itself, or with the previously introduced gas or vapor, comprises or constitutes the conditioning agent.

My invention further resides in methods having the features hereinafter described and claimed.

For an understanding of my invention, reference is to be had to the accompanying drawings in which:

Fig. 1, in perspective, illustrates formation of a tube from a web of flexible material;

Fig. 2, in perspective, illustrates closure of one end of the tube of Fig. 1 and in addition of filling material and a conditioning agent;

Fig. 3, in perspective, illustrates the completed, sealed package, before its severance from the web or strip;

Fig. 4 diagrammatically illustrates elements of a machine for performing the methods of Figs. 1 to 3 and several packages at successive stages of their completion;

Fig. 5 is a plan view in section taken on line 5—5 of Fig. 4;

Fig. 6 is a front elevational view, partly in section, of a modified form of filling tube;

Fig. 7 illustrates the method as applied to formation of square bags and significant parts of a mechanism for performing it;

into a tube T and the edges of the strip forming the seam of the tube joined in any suitable manner; for example, the edges of the strip may be overlapped to suitable extent to form a seam S which is made gas-tight in any desired or suitable manner. When the strip is of heat sealing "Cellophane", the sealing may be accomplished by applying heat and pressure, as by a corrugated, heated roll, along the overlapping edges of the strip.

The tube so formed is flattened, as at E, to provide a receptacle R closed at its lower end and open at its upper end; the flattened portion E may be sealed in any suitable manner; for example, when the strip S is of moisture-proof heat sealing "Cellophane", or of "Sylphrap", "Maralux" or like papers having a coating of, or impregnated with, a substance which softens upon application of heat, the sealing may be accomplished concurrently with the flattening of the strip by heated, clamping tools, preferably corrugated.

The contents of the package, such as candies, potato chips, soap flakes, or the like, is introduced into the tube at open end of the receptacle, which is thereafter closed and sealed, in any suitable manner, and particularly as hereinafter described. After formation of the seam S and closure E, and before, or during, addition to the receptacle R of the package contents or,

Patented May 30, 1939. Plaintiff's Exhibit 5 2,160,367

UNITED STATES PATENT OFFICE

2,160,367

METHOD OF MAKING SEALED PACKAGES

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application November 27, 1937, Serial No. 176,815

3 Claims. (Cl. 93—3)

My invention relates to methods of making, filling and sealing containers to form sealed packages, and particularly to methods of making, filling and sealing non-rigid containers for various solid materials.

In accordance with my invention, during formation and/or filling of a container and before its final closure, and preferably before and/or during the filling operation, there is introduced into the container a conditioning agent, specifically a desired gas, vapor, or mixture of gases, or vapors, for beneficially affecting or preserving the package contents, the agent remaining in the package after it is sealed.

More specifically, after formation of a tube from a web of "Cellophane", or other suitable, flexible material, and closure of the tube at one end to form a receptacle open at its other end, a desired gas, vapor, or mixture of gases or vapors, is caused to flow into the receptacle partially or completely to displace the air therein; preferably, the flow is continued until the receptacle is sealed, as by flattening the walls of the tube, above its contents, into adhesive relation with each other.

Further in accordance with my invention, there additionally may be introduced with the filling material, a gas or vapor, or mixture of them, of composition the same as, or different from, that previously introduced as aforesaid into the receptacle during its formation, which additional gas or vapor itself, or with the previously introduced gas or vapor, comprises or constitutes the conditioning agent.

My invention further resides in methods having the features hereinafter described and claimed.

For an understanding of my invention, reference is to be had to the accompanying drawings in which:

Fig. 1, in perspective, illustrates formation of a tube from a web of flexible material;

Fig. 2, in perspective, illustrates closure of one end of the tube of Fig. 1 and in addition of filling material and a conditioning agent;

Fig. 3, in perspective, illustrates the completed, sealed package, before its severance from the web or strip;

Fig. 4 diagrammatically illustrates elements of a machine for performing the methods of Figs. 1 to 3 and several packages at successive stages of their completion;

Fig. 5 is a plan view in section taken on line 5—5 of Fig. 4;

Fig. 6 is a front elevational view, partly in section, of a modified form of filling tube;

Fig. 7 illustrates the method as applied to formation of square ends and significant parts of machine for performing it;

Fig. 8 is a plan view in section, taken on line 8—8 of Fig. 7;

Figs. 9 and 10 illustrate another mode of making, filling and sealing a container using two webs of flexible material;

Fig. 11, in perspective, illustrates a third continuous method of making, filling and sealing containers;

Fig. 12, in perspective, shows the product resulting from the method of Fig. 11.

In the packaging of materials such as food products, medicinal powders or tablets, tobacco, and other materials, it is frequently desirable to preserve or modify their characteristics during the period elapsing before they are opened for use or consumption of their contents. In some cases, the nature of the contents of the package may be such the air in the package should be very dry, or again, of moisture content approaching saturation, or, in other cases, the atmosphere may preferably comprise or consist of some gas, such as nitrogen or carbon dioxide.

Although not in all aspects unsuited for use in connection with rigid packages, such as those of tin, glass, pitch-board, fiber or the like, my invention is especially suited for non-rigid sealed packages, particularly those made of flexible materials such as "Cellophane", paper, or the like.

Referring to Fig. 1, a web or strip W of bag material fed, for example, from a roll A is formed into a tube T and the edges of the strip forming the seam of the tube joined in any suitable manner; for example, the edges of the strip may be overlapped to suitable extent to form a seam S which is made gas-tight in any desired or suitable manner. When the strip is of heat sealing "Cellophane", the sealing may be accomplished by applying heat and pressure, as by a corrugated, heated roll, along the overlapping edges of the strip.

The tube so formed is flattened, as at E, to provide a receptacle R closed at its lower end and open at its upper end; the flattened portion E may be sealed in any suitable manner, for example, when the strip S is of moisture-proof heat sealing "Cellophane", or of "Sylphrap", "Marallux" or like papers having a coating of, or impregnated with, a substance which softens upon application of heat, the sealing may be accomplished concurrently with the flattening of the strip by heated, clamping tools, preferably corrugated.

The contents of the package, such as candies, potato chips, soap flakes, or the like, is introduced into the tube or open end of the receptacle which is then after closed and sealed, in any suitable manner, and particularly as hereinafter described. After formation of the seam S and closure E and before, or during, addition to the receptacle R of the package contents or...

5/30

filling material F, the desired or selected conditioning agent is introduced into the receptacle, as through the tube 1. When the conditioning agent is gaseous, such as dry or moist steam, carbon dioxide, nitrogen or the like, the addition of the conditioning agent may be for a predetermined time, by a predetermined amount, or may be continuous throughout the formation, filling and closing of the package.

The gas or vapor, or mixture of them, introduced into the open-ended receptacle or bag more or less completely displaces the air therefrom and maintains its distended form to receive its intended solid contents, whether they be in the form of powders, flakes, tablets, or any other shape or form.

After or during introduction of the conditioning gas, the strip W, or tube T, is fed to bring the solid contents suitably below the lower end of the tube 1, whereupon the tube T is again flattened, as in Fig. 3, to form the second seal E for the upper end of the package or receptacle R. The completed package containing the filling material F and the conditioning gas is then severed from the strip. For continuous flow of the conditioning agent through the pipe 1, the clamping of the tube to form the upper seal E serves as an automatic cut-off preventing further addition of gas to the receptacle or escape of gas when the strip is severed as hereinafter described.

The clamping of the tube as foresaid to provide the top seal for package R concurrently forms the bottom closure for the next receptacle R1 which, for continuous flow of gas through pipe 1, immediately begins to receive conditioning agent before or during addition of the filling material.

As thus far described, the packages are in a continuous string attached to each other by the flattened portions E of the strip or web; to form individual packages, each of the seals E is cut crosswise, as in Fig. 4, by a knife 14 or the like.

Although not limited to any particular mechanism, my method may be conveniently performed by suitable modification of known types of package-forming and filling machines, for example, a machine of the type illustrated and described in Zwoyer Patent #1,986,422 or of the type shown in Aldrich Patent #1,937,501.

Referring to Fig. 4, the web W is threaded over the shoulder plates 2, 2, and thence downwardly between the outer former-tube 3 and inner former-tube or mandrel 4. The edges of the strip are led downwardly and across, one inside the other, to form a seam; the left-hand edge of the strip is led to the right by the guide piece 5, while the right-hand edge of the strip is led to the left by the guide piece 6. Thus there is formed on the outside of the inner former-tube 4, a tube T of flexible bag material with a longitudinal seam comprised of the overlapping edges of the web or strip. A heated corrugated roll presses the overlapping edges of the web against tube 4 to form the seal S. The flexible tube T is flattened, beyond the former-tube 4, to form the seal E by the heated clamping tools 7 which move from the dotted to the solid line positions indicated in Fig. 4, to draw further web material from the roll A for shaping into tubular form as above described. The flattening of the tube T at E forms a receptacle whose lower end is closed and whose upper end surrounds the former-tube 4.

The contents of the bag are fed thereinto, by gravity or some positive feeding means, through the passage or tube 8 disposed within the inner former-tube 4. The amount of material fed for each movement of the clamping tools 7 from and back to its dotted line position may be regulated in any desired way, for example, by a cut-off valve in a hopper or conduit forming a continuation of tube 8, or by any other of the known expedients used in filling machines.

As appears in Figs. 4 and 5, the space between the filling tube 8 and the inner former-tube 4 is divided, as by partitions 9, 9, into two chambers 10, 12, which extend lengthwise of the filling tube 8 and which are out of communication with each other except at their lower ends. At its upper end the chamber 10 is in communication with a pipe or conduit 11 extending to the source of conditioning gas or vapor. In the communication line between the gas source and chamber 10 there may be interposed any suitable valve mechanism for controlling the pressure or rate of flow of gas and/or suitable valve mechanism operated manually, or automatically, in timed relation to the formation, filling and closing of packages on and below the tube-forming mandrels 3 and 4.

The upper end of chamber 12 is in communication with a pipe or conduit 13 which may discharge to waste or to reclamation apparatus.

In the absence of control valves in the supply line 11, gas flows continuously from the source through chamber 10 into the closed tube or partially formed package extending from the former-tube 4 to the clamping tools 7, and thence upwardly through chamber 12 and out of the discharge pipe 13 which is preferably provided with a check-valve not shown.

The flow of gas or vapor replaces the air within the receptacle including any air which may have been entrained by the filling material during its movement from a hopper or other source of supply downwardly through tube 8. Preferably the flow of conditioning gas continues, insofar as any particular receptacle is concerned, until after it has been filled and the clamping tools have flattened the tube T above the contents or filling material to complete the sealing of that receptacle. My invention is not limited, however, to such continuous flow of conditioning agent, for a valve in the gas-supply line may be timed to provide for introduction of a predetermined amount of conditioning agent into each package.

After each package has been filled and sealed, it is severed from the continuous strip as by a knife 14, Fig. 4, which cuts midway of the flattended portion E betwegn two successive packages. If desirable or necessary, a suitable strip of metal or foil may be applied to embrace the ends of the packages to add strength to the seal. For most applications this is not necessary, particularly when the strip is moisture-proof, heat-sealing "Cellophane", since the heat and pressure applied to the ends and seam form a joint which remains gas-tight for all ordinary handling.

When the material is not free-flowing and tends to jam in the tube 8, there may be provided a feed auger 15, Fig. 6, extending lengthwise and interiorly of the tube 8. Such an auger also may be utilized to provide for feed of a predetermined amount of material to each receptacle in turn; in such case, the auger 15 is intermittently actuated to rotate a predetermined angular extent between successive strip-feeding movements of the clamping tools 7.

When it is desired to make bags of the square type, the shape of the inner former-tube is cut-

respondingly modified, as shown in Figs. 7 and 8. The upper cylindrical portion of the former-tube gradually merges into a portion 4A of rectangular cross-section and accordingly the tube T of bag material is caused to assume a similar shape. The inner former-tube and the filling tube 8 may be, as suggested in Fig. 8, a single piece or may be fabricated; specifically, as shown in Fig. 8, the gas inlet duct 10 and gas outlet duct 12 are formed in the walls of a member 4A whose hollow center provides for flow of the filling material to the receptacles, and whose outer perimeter corresponds in shape to the receptacles to be formed. In the particular example shown, the interior configuration of the passage for filling material is suited for crackers or wafers C.

In similar manner, a conditioning agent may be introduced into packages, formed from two webs of flexible material, during their formation, before and/or during filling thereof, and before their severance from the two webs after sealing. Referring to Fig. 9, the two webs W1, W2, of any of the flexible materials herein contemplated, are drawn from rolls A1, A2 and shaped, as about former-tube 4, into a tube T2. Each of the webs is of a width somewhat greater than half the circumference of tube 4 to provide margins or flanges eventually to be joined, as by application of heat and pressure to form the seams S1, S2 extending from tube T2, Fig. 10. As in the preceding methods, the tube T2 is flattened below the lower end of the former-tube 4 to provide an end seal E for the lower end of a bag or receptacle R8 whose upper end at that time snugly fits the former-tube 4. Before and/or during the filling of the bag with candies, powders, or the like, which are introduced into it through the filling conduit 8, a conditioning gas is permitted or caused to flow into the bag from duct 10, the excess flowing out of the bag through duct 12. The tube of web material is then flattened and sealed above the filling material to form a closed package R7, which is subsequently severed from the web, as indicated in Figs. 9 and 10, and so then becomes a separate individual package R8.

In the method illustrated in Fig. 11, the edges of a single web W3 of package material, instead of being overlapped as in Fig. 1, are brought into face to face engagement to form a seal S3 extending outwardly from the former-tube 4. As in the prior methods described, during the formation of a package, a conditioning gas is introduced thereinto, preferably before or during filling of the bag, when in the position of bag R11. After the bag is sealed above the contents, as indicated by bag R10, it is detached from the web by cutting of seal E transversely of the web to form the completed package R9 containing solid contents and a conditioning agent therefor.

Though in the methods specifically described, I prefer to use, because of simplicity of seal-formation, web material coated or impregnated with a bonding substance which becomes plastic or adhesive upon application of heat, my invention comprehends use of other types of adhesives; for example, unset glue may be applied to those surfaces of the web or webs which subsequently are to be joined to form the various seals of each package.

It is sometimes desirable, in any of the methods described herein, to provide for introduction with the filling material of a conditioning gas or vapor which may be the same as or different from that introduced through pipe 6 of Fig. 2 or duct 11 of Figs. 4, 6, 7, 9 or 11. This is readily accomplished when the gas is heavier than air, by utilizing, for the solid material to be packaged, a hopper of considerable depth. When heavy gas, for example, carbon dioxide, is supplied to the hopper, it sinks toward the bottom thereof to displace air which otherwise would pass with the material to the bags during the filling operation. The downward movement of tube T or T1 by the clamping tools affords a pumping action which may be utilized to draw the heavy gas from the hopper through conduit 8 into the receptacles as they are successively formed.

What I claim is:

1. The method which comprises intermittently flattening and transversely sealing a tube of web material to form flattened seal sections spaced longitudinally of the tube, solely by intermittently pulling the flattened web material over a tubular form pulling from a supply sufficient web material to form a container, solely by so pulling the web material over the form intermittently reducing the pressure within the tubular form, during each pull upon the web material joining the edges thereof before they pass beyond said form, between successive pulls upon the web material introducing solid filler and conditioning gas into each container in succession through the form in which obtains reduced pressure as aforesaid sufficient alone to draw adequate conditioning gas into the tube, and severing the web through the seal sections to detach the filled containers.

2. The method of producing containers and filling them with solid material and a conditioning gas or vapor therefor which comprises intermittently forming flattened seal sections spaced along a tube of web material, intermittently feeding the web material solely by pulling over a form a supply thereof sufficient web material to form a container, solely by so pulling the web material over the form intermittently effecting reduced pressure within the form sufficient alone to draw conditioning gas or vapor into the tube, introducing solid material into each container concurrently with or after introduction of the aforesaid gas or vapor, and severing the web material through said flattened seal sections to detach filled containers.

3. The method of producing containers and filling them with solid material and a conditioning gas or vapor therefor which comprises drawing web material over a tubular form to shape it into a tube, sealing the longitudinal edges of the tube to each other, intermittently transversely flattening the tube to form seal sections spaced longitudinally of the tube, bringing into mixture with each other the solid material and the conditioning gas or vapor to constitute a bulk supply thereof sufficient for filling many containers therewith, effecting aforesaid drawing of web material over the form solely by pulling the flattened web material, solely by so pulling the web material over the form effecting reduced pressure therein sufficient alone to draw the gas into the tube, after formation of each seal feeding the mixture from said supply through the tubular form into the tube shaped as aforesaid, and severing the web material through said flattened seal sections to detach filled containers.

DANIEL E. MAXFIELD.

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1938 7 Sheets-Sheet 1

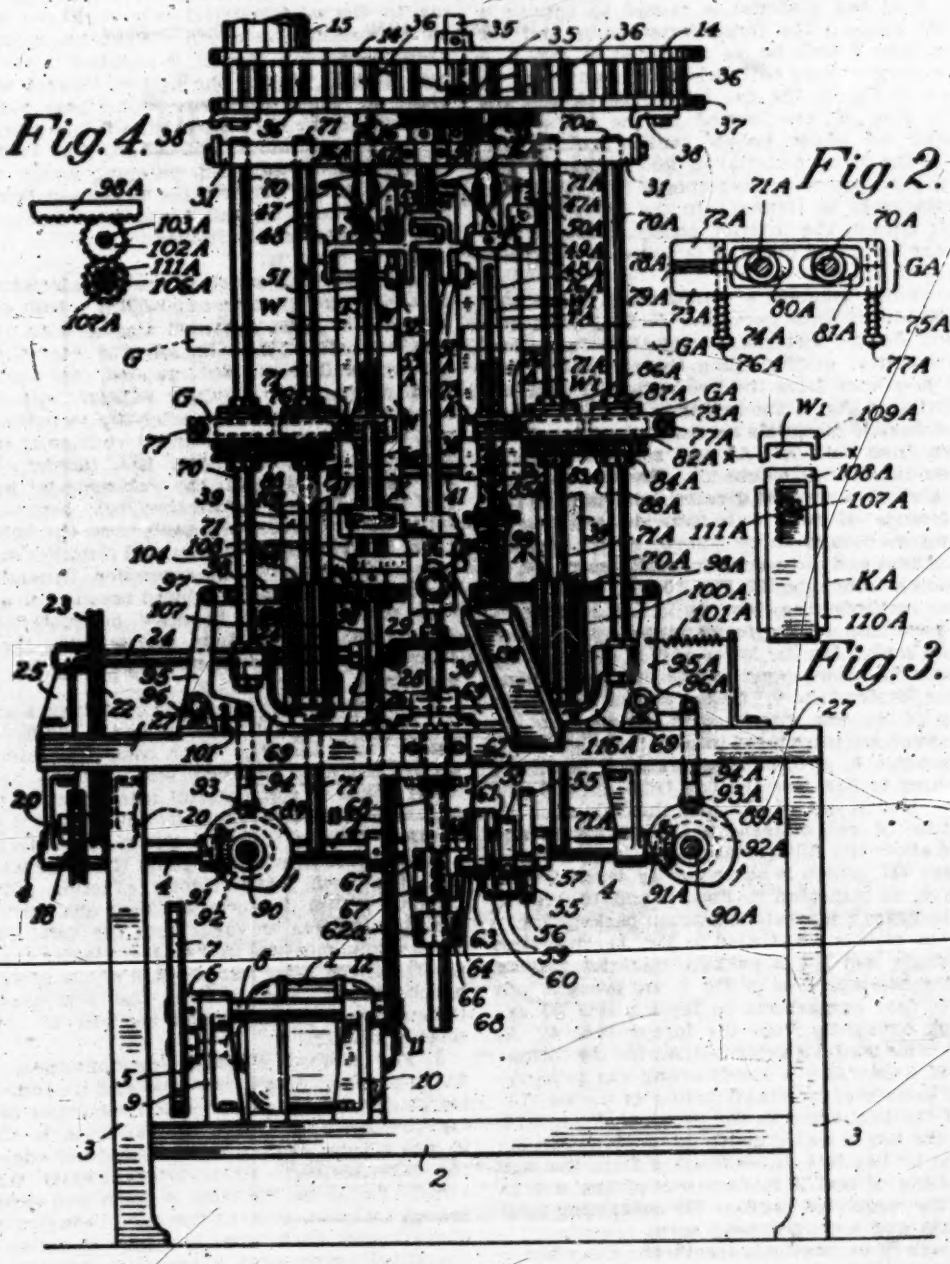

Fig. 4.

Fig. 2.

Fig. 3.

Fig. 1.

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5/4/6

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1939 7 Sheets-Sheet 2

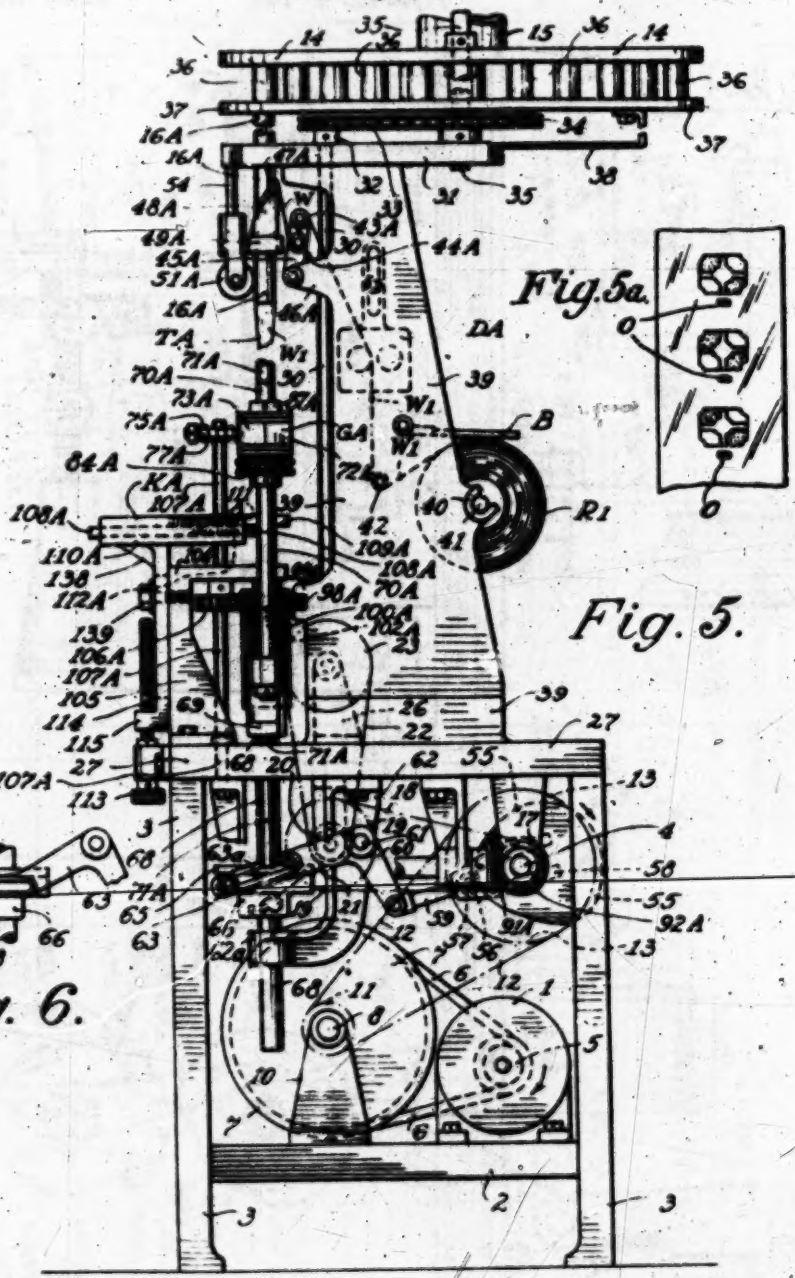

Fig. 5.

Fig. 5a.

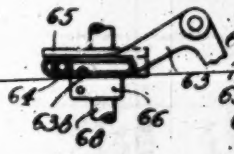

Fig. 6.

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5/47

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1938 7 Sheets-Sheet 3

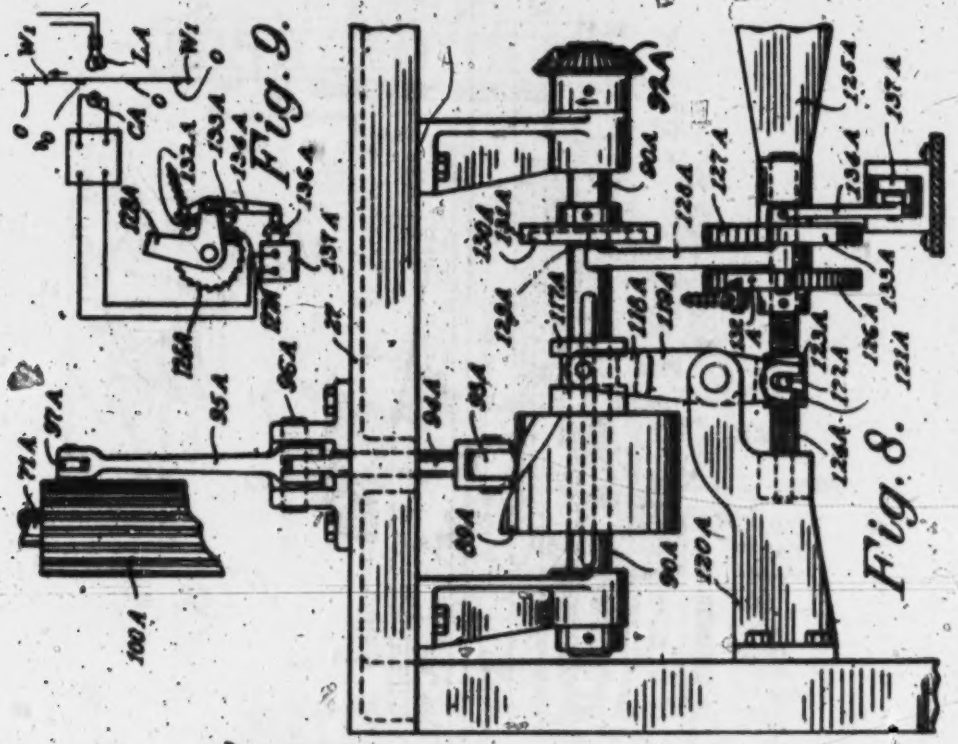

Fig. 9.

Fig. 8.

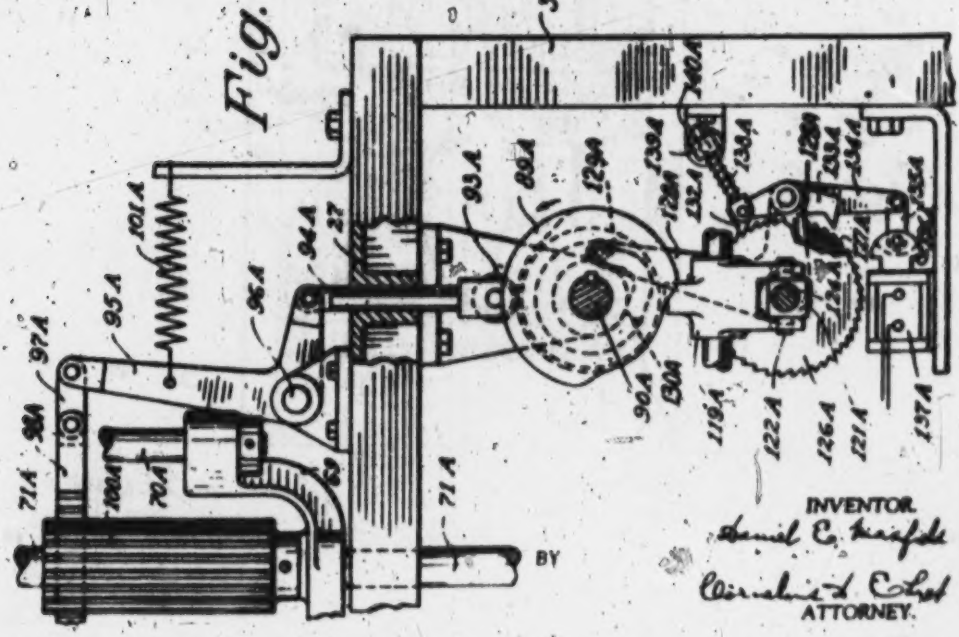

Fig. 7.

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5/48

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1939 7 Sheets-Sheet 4

Fig. 10.

Fig. 15.

Fig. 16.

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5/49

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 6, 1938 7 Sheets-Sheet 5

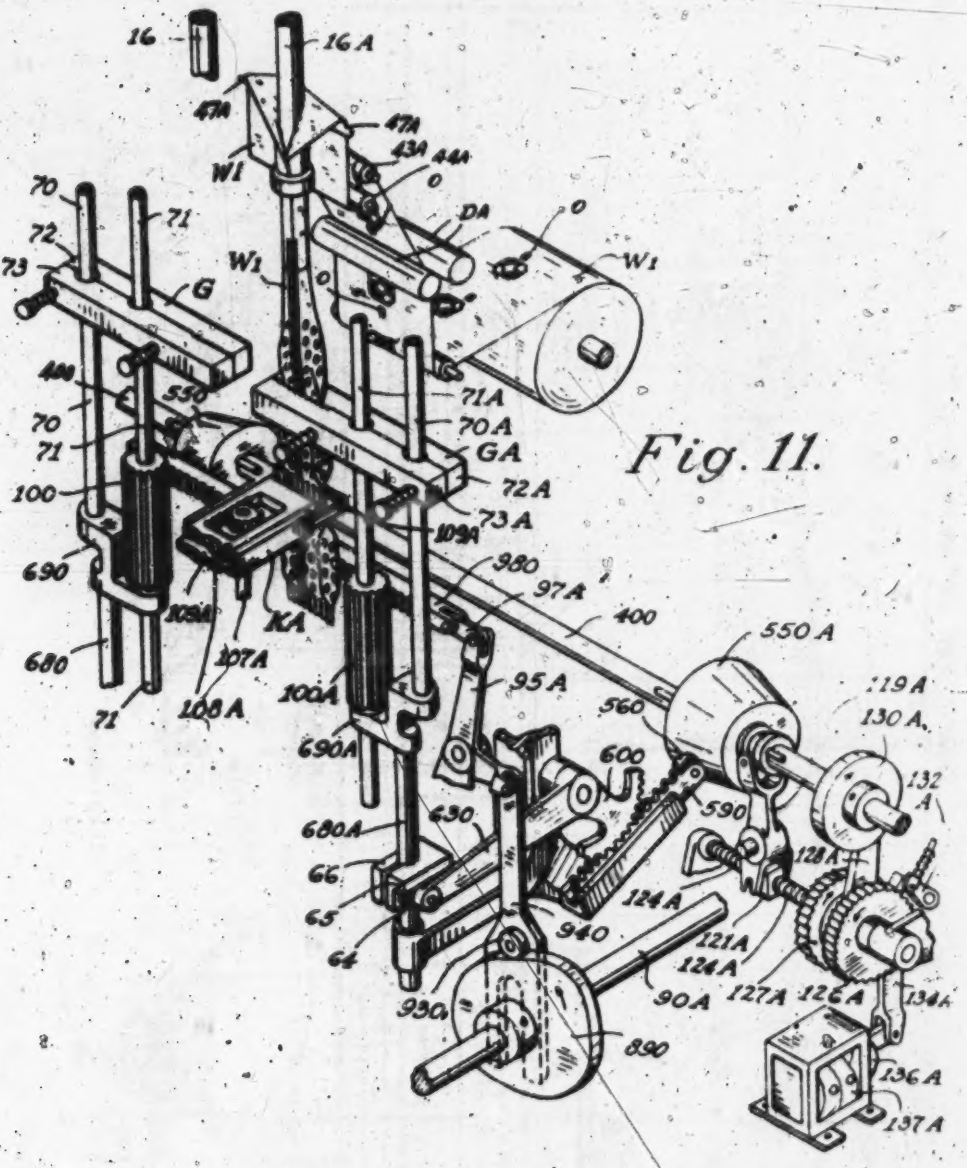

Fig. 11.

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5/50

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May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1938 7 Sheets-Sheet 6

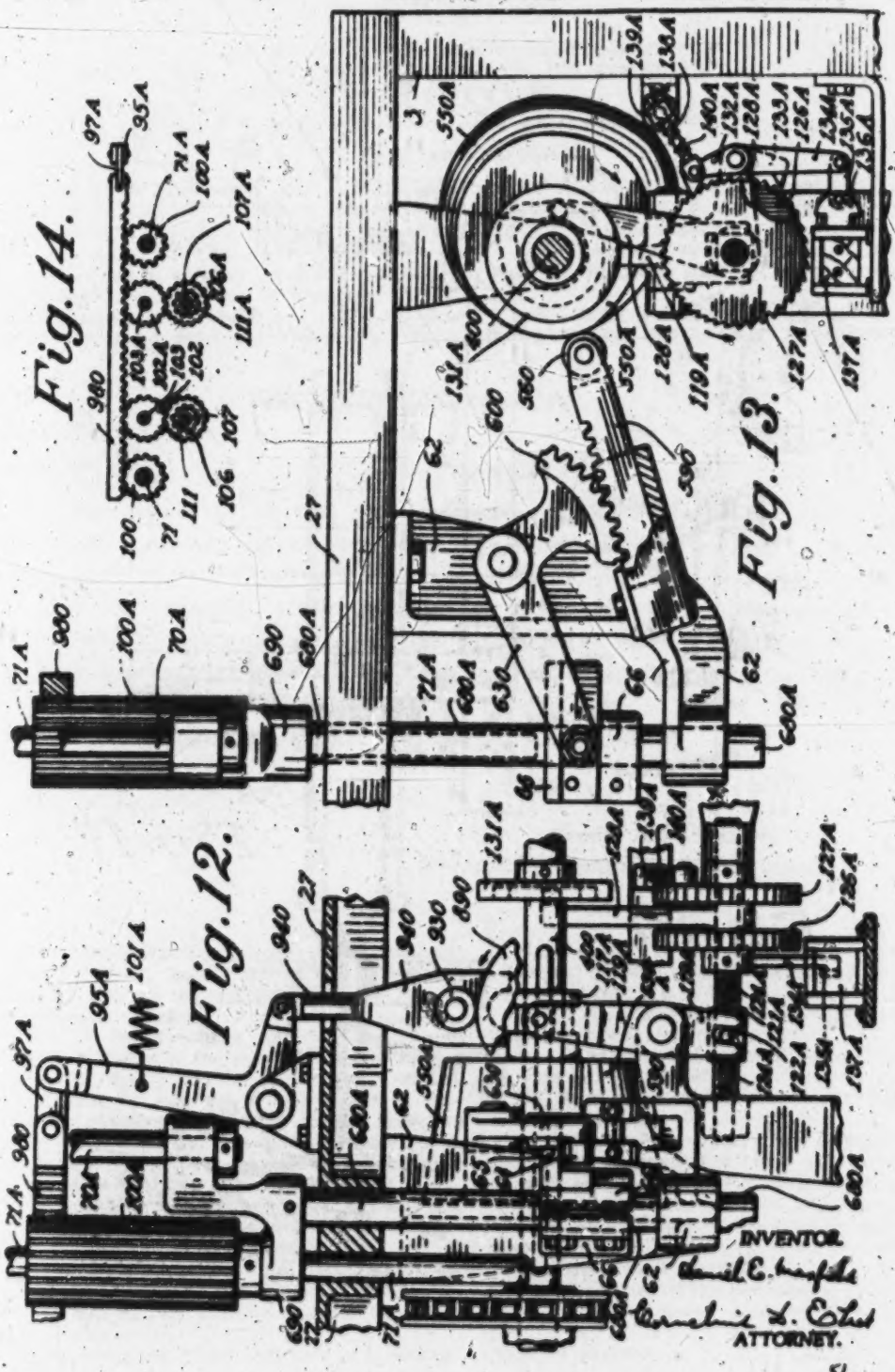

Fig. 14.

Fig. 13.

Fig. 12.

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5/51

Plaintiff's Exhibit 5

May 7, 1940. D. E. MAXFIELD 2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Filed May 4, 1939 7 Sheets-Sheet 7

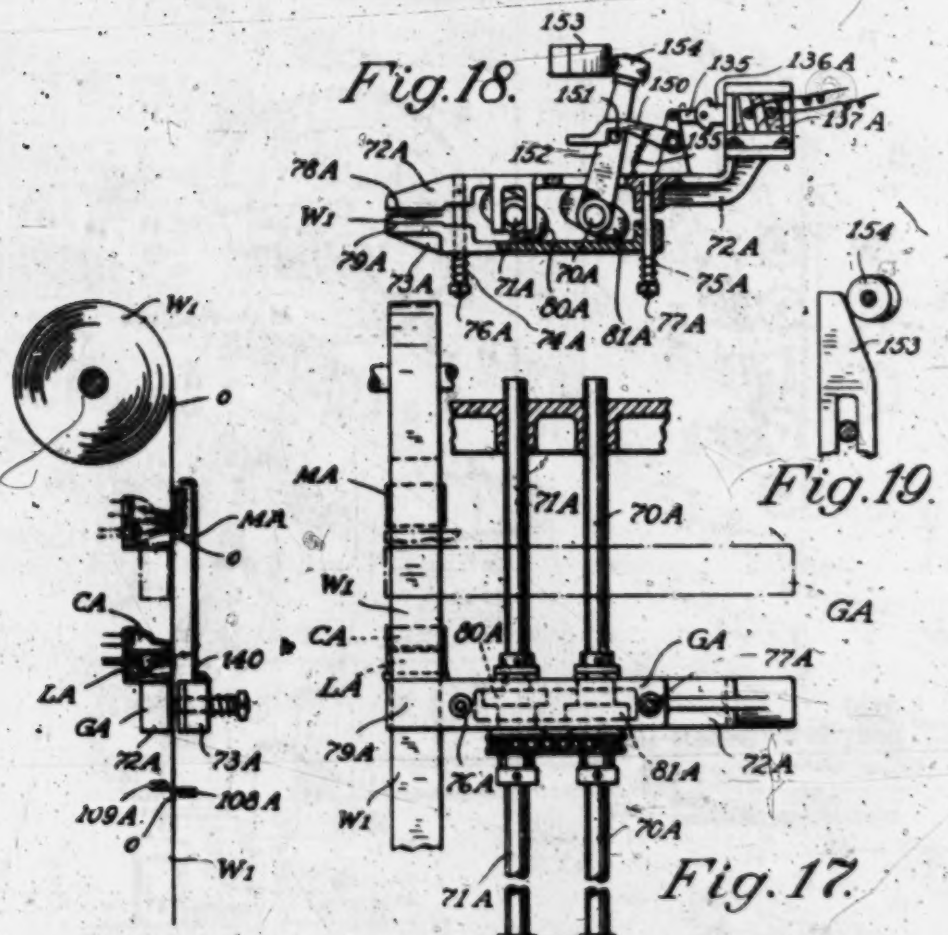

Fig. 18.

Fig. 19.

Fig. 20.

Fig. 17.

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5/53

Plaintiff's Exhibit 5

Patented May 7, 1940 2,199,708

UNITED STATES PATENT OFFICE

2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Application May 4, 1938, Serial No. 206,937

16 Claims. (Cl. 164—48)

My invention relates to methods of and apparatus for feeding web material which is formed and severed to constitute packages, containers or the like, or wrappers, labels, or the like.

In accordance with my invention control elements are regularly and substantially equally spaced longitudinally of the web, and the feeding of the web is actuated or controlled not in accordance with the spacing of the control elements but in accordance with the spacing of the severances of the web material.

Fig. 3 is a plan view of web-severing mechanism shown in Fig. 5 and corresponding with a similar mechanism shown in Fig. 1;

Fig. 4 is a plan view of parts appearing in Fig. 5 and corresponding with similar parts shown in Fig. 1;

Fig. 5 is an end elevational view of the packaging machine of Fig. 1 with parts omitted and

CERTIFICATE OF CORRECTION.

Patent No. 2,199,708. May 7, 1940.

DANIEL E. MAXFIELD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 11, for "suffix A" read --suffix "A"--; page 9, second column, line 38, claim 14, after the word "said" insert --the relatively movable members of said--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of March, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

ing a constant length of stroke: in another form of my invention, exemplified by Figs. 11–16, the extent of feed of the web for successive feeding movements is changed by varying the length of stroke of web-clamping mechanism without change in timing of the web-engaging gripper or equivalent; in still another form of my invention, exemplified by Figs. 17–20, the extent of forward or effective feed of the web is predetermined by controlling the time of closure upon the web of the gripper mechanism during each return stroke thereof.

My invention further resides in the methods and in the features of construction and arrangement hereinafter described and claimed.

For an understanding of my invention and for illustration of various embodiments thereof, reference is to be had to the accompanying drawings in which:

Fig. 1 is a front elevational view of a packaging machine with parts omitted and parts broken away;

Fig. 2 is a plan view of web-clamping mechanism shown in Fig. 1;

Fig. 17 is a front elevational view of significant elements of still another modification of the packaging machine of Fig. 1;

Fig. 18 is a plan view, partly in section, of web-engaging mechanism of Fig. 17;

Fig. 19 is a front elevational view of parts appearing in Fig. 18; and

Fig. 20 is an end elevational view of parts appearing in Fig. 17.

Referring to Figs. 1 and 5, the packaging machine there disclosed is suited to join the margins of webs of material thus to form tubes, each of which is transversely flattened and sealed at intervals longitudinally of the tube to form packages each of which is filled while still attached to the web, and is thereafter detached from the web by severance of the web material through a sealing section joining adjacent packages. In general, the machine is of the type disclosed in United States Zwoyer Patent #1,986,422.

Referring to Figs. 1 and 5, the motor 1, mounted upon the shelf 2 extending between the legs 3 of the machine, drives the main shaft 4 through pulley 5 on the motor shaft, belt 6 which passes

5/36

Plaintiff's Exhibit 5

Patented May 7, 1940 2,199,708

UNITED STATES PATENT OFFICE

2,199,708

METHOD OF AND APPARATUS FOR FEEDING WEB MATERIAL

Daniel E. Maxfield, Philadelphia, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Application May 4, 1938, Serial No. 205,937

16 Claims. (Cl. 164—48)

My invention relates to methods of and apparatus for feeding web material which is formed and severed to constitute packages, containers or the like, or wrappers, labels, or the like.

In accordance with my invention control elements are regularly and substantially equally spaced longitudinally of the web, and the feeding of the web is adjusted or controlled, not in accord with nor in response to the spacing between any particular control elements on the web, nor in accord with the arrival of any particular control element at any particular position, but by adjusting the effective length of linear feed of the web by a series of very small and preferably equal increments or decrements of predetermined magnitude so that the operation of registry or positioning of the web is characterized by web-feeding movements either increasing or decreasing in length, but nevertheless each increment or decrement does not, except by occasional coincidence, precisely correct the web-feeding movement but does always correct the movement in the right direction, shortening it when it is too long and lengthening it when too short, all the time hunting the average spacing of the control elements on the web; to obtain substantially similar location on the containers of printing, decorations, or the like, generically termed "designs" recurrently appearing on the web material.

In accordance with one form of my invention, exemplified by Figs. 1–10, the extent to which the web is advanced for different feeding movements thereof is varied, in accordance with responses of the detector, by changing the time of release of the web during the forward or feeding strokes of a web-engaging clamp or gripper having a constant length of stroke; in another form of my invention, exemplified by Figs. 11–16, the extent of feed of the web for successive feeding movements is changed by varying the length of stroke of web-clamping mechanism without change in timing of the web-engaging gripper or equivalent; in still another form of my invention, exemplified by Figs. 17–20, the extent of forward or effective feed of the web is predetermined by controlling the time of closure upon the web of the gripper mechanism during each return stroke thereof.

My invention further resides in the methods and in the features of construction and arrangement hereinafter described and claimed.

For an understanding of my invention and for illustration of various embodiments thereof, reference is to be had to the accompanying drawings in which:

Fig. 1 is a front elevational view of a packaging machine with parts omitted and parts broken away;

Fig. 2 is a plan view of web-clamping mechanism shown in Fig. 1;

Fig. 3 is a plan view of web-severing mechanism shown in Fig. 5 and corresponding with a similar mechanism shown in Fig. 1;

Fig. 4 is a plan view of parts appearing in Fig. 5 and corresponding with similar parts shown in Fig. 1;

Fig. 5 is an end elevational view of the packaging machine of Fig. 1 with parts omitted and parts broken away;

Fig. 5a is a face view, on enlarged scale, of one of the webs shown in Fig. 1;

Fig. 6 is a detail view of a modification of parts shown in Figs. 1 and 3;

Fig. 7 is a front elevational view, on enlarged scale, of adjustable control means for mechanisms of Figs. 2 and 3;

Fig. 8 is an end elevational view of parts appearing in Fig. 7;

Fig. 9 diagrammatically illustrates an electric circuit for control of mechanism shown in Figs. 7 and 8;

Fig. 10 is a timing chart referred to in explanation of the operation of the mechanism of Figs. 7 and 8;

Fig. 11 in perspective discloses the significant elements of a modification of the packaging machine of Fig. 1;

Fig. 12 is a front elevational view on enlarged scale of parts appearing in Fig. 11;

Fig. 13 is an end elevational view of parts appearing in Fig. 12;

Fig. 14 is a plan view of parts appearing in Fig. 11;

Figs. 15 and 16 are diagrams referred to in explanation of the construction of cam means shown in Figs. 12 and 13;

Fig. 17 is a front elevational view of significant elements of still another modification of the packaging machine of Fig. 1;

Fig. 18 is a plan view, partly in section, of web-engaging mechanism of Fig. 17;

Fig. 19 is a front elevational view of parts appearing in Fig. 18; and

Fig. 20 is an end elevational view of parts appearing in Fig. 17.

Referring to Figs. 1 and 5, the packaging machine there disclosed is suited to join the margins of webs of material thus to form tubes, each of which is transversely flattened and sealed at intervals longitudinally of the tube to form packages each of which is filled while still attached to the web, and is thereafter detached from the web by severance of the web material through a sealing section joining adjacent packages. In general, the machine is of the type disclosed in United States Zwoyer Patent #1,966,422.

Referring to Figs. 1 and 5, the motor 1, mounted upon the shelf 2 extending between the legs 3 of the machine, drives the main shaft 4 through pulley 5 on the motor shaft, belt 6 which passes

over pulley 5 and the pulley 7 on the jack shaft 8, supported as by brackets 9, 10 from shelf 2, and sprocket 11, on shaft 8, connected by a chain 12 to the sprocket 13 on shaft 4. The turret 14 at the top of the machine which, by means of measuring tubes 36, feeds the material with which the packages are to be filled from the hopper or supply duct 15 to the filling tubes 16 and 16A, is continuously driven from shaft 4 by the train of mechanism comprising sprocket 17 on shaft 4, chain 18, sprocket 19 on jack shaft 20, sprocket 21 on shaft 20, chain 22, sprocket 23 on shaft 24 supported, as by brackets 25, 26 from the frame member 27 of the machine, pinion 28, on shaft 24, which engages the bevel gear 29 on the vertical shaft 30 which extends through and beyond the frame member 31 and to whose upper end is secured the sprocket 32 connected by chain 33 to sprocket 34 on shaft 35 to which is secured the turret head or plate 14.

From the under side of the turret plate 14 there extend a plurality of cylinders or measuring tubes 36 each in register with openings through plate 14 to receive a charge of material as it passes beneath the open end of the stationary supply hopper 15 or equivalent. The plate 37, suitably secured as by brackets 38 to the frame member 31 of the machine, serves to close the open bottoms of the cylinders 36 as they revolve with the turret head 14 except when each, in turn, passes over openings in plate 37 which are in register with the filling tubes 16 or 16A.

During each cycle of the package-forming mechanism hereinafter described, a pair of tubes 36 pass over and discharge their contents into the filling tubes, and thereafter pass beneath the hopper 15 for refilling.

From the rear of the upright frame members 39 of the machine there extend the U-shaped bearing members 40 for receiving a bar or rod 41 which supports the rolls or reels R, R1 of packaging material, which, for purposes of explanation, is assumed to be moisture-proof Cellophane, Pliofilm, or other material consisting of, impregnated with, or otherwise surfaced with a material which is adhesive or plastic when subjected to heat.

The web W1 from roll R1, Fig. 5, is threaded through the machine to pass beneath the idler bar or roll 42, thence upwardly between the elements of a registration-detector DA, hereinafter more fully described, thence over and under the tensioning rolls 43A, 44A on the spring-biased arm 45A (biasing spring not shown) pivotally mounted upon the extension 46A of frame member 39, and then upwardly and over the spreader 47A. Beyond the spreader web W1 is formed into a tube TA about the filling tube 16A by the forming tool 49A attached to the bracket 48A which is adjustably secured to the bar 50A (Fig. 1) extending downwardly from the frame member 31.

The web W from the other roll R of packaging material is similarly threaded through the machine and is formed into a tube T about the filling tube 16; the elements for guiding and forming web W are identified in Fig. 1 by the same reference characters, but with omission of the suffix "A", utilized to identify the corresponding elements associated with web W1.

The forming tools 48, 48A, which may be of construction more clearly shown in the aforesaid Zwoyer Patent #1,986,422, each shapes the associated web into the form of a tube and also effects overlap of the web margins at the front of the filling tubes 16, 16A. The margins of each web are joined by application of heat and pressure to form a closed tube; specifically, the overlapping margins of web W are pressed together by the roll 51 in the core of which are disposed several turns of wire electrically heated so as to raise roll 51 to temperature sufficient to soften the thermo-plastic or adhesive material of the overlapping web margins and so effect their union.

The roll 51A, Fig. 5, similarly operates upon the margins of the web W1 to form a closed or circumferentially continuous tube of web material about the filling tube 16A. The sealing rolls 51, 51A are respectively mounted upon shafts 52, 52A individually supported by the frames 53, 53A pivotally mounted for angular movement in a horizontal plane upon the rod 54 extending downwardly from the frame member 31 of the machine.

During each cycle of the machine, the webs W, W1 are individually flattened below the lower ends of their respective filling tubes, and are drawn downwardly, by heated clamping tools G, GA which seal the tubes of web material transversely thus to form containers closed at their lower ends but whose upper ends are open and in communication with the filling tubes 16, 16A for filling purposes. The feeding movement of each web also brings a previously formed package beyond a knife mechanism, hereinafter described, which cuts the web to detach a filled and sealed package from the web material. A brake member, such as pivoted member B, Fig. 5, prevents the inertia of each roll of web material from producing slack in the web material fed therefrom.

Because the mechanisms for feeding the webs W, W1 and for severing them to form individual packages are substantially identical, it is necessary specifically to describe only the mechanism for feeding and cutting one of the webs; the corresponding elements of the feeding and cutting mechanisms for the two webs will be identified by the same reference characters but the mechanism associated with the web W1 will have added thereto the suffix A.

Upon the main shaft 4 is mounted the cam 55 which effects reciprocation of the web-grippers G, GA downwardly from and back to their broken line positions indicated in Fig. 1. The periphery of cam 55 is engaged by the roller 56 on pin 57 which extends from the yoke member 58 whose forked end straddles shaft 4 and which is connected by bar 59 to one arm 60 of a bell crank lever pivoted at 61 to bracket 62 secured to the under side of the frame member 27. The other arm 63 of the bell crank lever is slotted adjustably to receive the supporting stud for a roller 64 which engages the under side of the horizontal extension 65 of member 66 adjustably secured as by the bolts 67 to the plunger 68 whose lower end passes through the bearing 62a afforded by bracket 62, and whose upper end passes beyond the top of the table or frame member 27. Attached to or integral with the upper end of the plunger 68 is a cross arm 69 whose opposite ends provide bearings for the lower ends of the shafts 70, 70A which extend through the web-gripping devices G, GA. The shafts 71, 71A extending parallel to and closely adjacent the shafts 70, 70A respectively pass through the cross member 69 and the top 27 of the machine frame; the upper ends of the shafts 70, 71 and 70A, 71A pass

5/38

through and are guided by the frame member 31 below the feeding turret 14 of the machine.

As more clearly appears in Fig. 2, the shafts 71A, 78A pass between the two halves of the web-gripper device GA. The two gripper members 72A, 73A are biased toward each other by the springs 74A, 75A which respectively encircle the pins 76A, 77A extending through member 73A and attached to member 72A. When the shafts 78A and 71A are in the angular position shown in Fig. 2, the springs 74A, 75A are effective to hold the corrugated, web-engaging jaws 78A, 79A in clamping engagement with web W1. The jaws 78A, 79A are heated, preferably electrically, as in aforesaid Zwoyer patent, to soften the thermoplastic or adhesive surface of the web and so form, during their clamping engagement with the tube TA, a flattened sealing section extending transversely thereof.

When the shafts 70A and 71A are concurrently moved in the same direction through a substantial angle, as hereinafter described, the cam members 80A, 81A secured respectively to shafts 78A and 71A effect separation of the gripper jaws and so release the web or tube TA.

The under surface of gripper members 72A, 73A engage the spacer members 82A, 83A supported respectively by the sprockets 84A, 85A on the shafts 78A, 71A. The upper surfaces of the gripper members are engaged by the flanged members 86A, 87A suitably secured to shafts 71A and 78A. The sprockets 85A and 84A are connected by chain 88A to effect rotation of the shafts in unison when one of them is actuated as hereinafter described.

The shafts 70 and 71 support the similar web-clamping device G whose jaws are moved toward and from web-clamping position by angular movements of the shafts 70, 71.

During rotation of shaft 4 the cam 88 effects reciprocation of the cross member 89 to effect vertical reciprocation of the two web-clamping devices G, GA. Substantially at the top of the stroke of the cross member 89, the shafts 71 and 71A are rotated as hereinafter described to effect closure of the jaws of the two grippers G, GA so that during the downward movement both webs are pulled downwardly with respect to their associated filling tubes 16, 16A. The flattening and sealing action of grippers G, GA completes the sealing of a pair of filled containers and seals the bottom of a pair of containers whose upper ends are open for filling through tubes 16, 16A.

Before the cross arm 89 reaches the bottom of its stroke, the web-feeding devices G, GA are individually controlled, as hereinafter described, to release the webs W, W1.

The length of the stroke of the cross member 89 and the parts movable therewith is adjustable to suit the machine for making packages of different lengths. Referring to Fig. 5, when the roll 94 is clamped near the outer end of the slot in the oscillatory arm 93, the vertical stroke of the cross member 89 which carries the grippers G, GA is substantially longer than when the adjusted position of roller 94 on the slotted arm 93 is nearer the pivot 91. With the arrangement shown in Fig. 5, a change in position of roller 94 with respect to the axis of rotation of the lever arm 93 not only changes the length of the stroke of member 89 but also affects its position at the bottom of its stroke; the shorter the stroke, the higher the lowermost position of cross-arm 89 unless member 96 on plunger 98 is readjusted. By recourse to the construction shown in Fig. 6, the length of stroke may be varied to suit different lengths of the package without change of the position of the cross arm 89 at the bottom of its stroke. The advantage of the modification will become more apparent after subsequent description of the severance of the webs to detach packages therefrom.

In the construction shown in Fig. 6 the slot 93b, instead of being radial like the slot 93A, Fig. 5, is substantially parallel to the end face of the member 96 when plunger 98 is at the bottom of its stroke; therefore, adjustment of roller 94 to various positions along slot 93b to obtain various lengths of stroke of the plunger 98 does not change the lowermost position of the plunger or of the grippers G, GA movable therewith.

The opening and closing movements of the gripper mechanism G are controlled by barrel cam 99, Fig. 1, rotatable with shaft 90 driven from main shaft 4 of the machine by the bevel gears 91, 92 secured, respectively, to shaft 4 and shaft 90. The periphery of cam 99 continuously engages the roller 93 at the lower end of the vertically reciprocable member 94 whose upper end is pivoted to one arm of a bell-crank lever 95 supported by bracket 96 on the upper surface of the table member 27 of the machine. The other arm of the bell-crank lever is connected by link 97 to the rack member 98 slidable within a guide member 99 attached to or integral with the frame member 39 of the machine. The rack 98 is continuously in mesh with the elongated gear 100 attached to shaft 71. Throughout the vertical reciprocation of the gripper frame 89, the gear 100 remains in engagement with the rack in order that cam 99 may effect opening and closing of the gripper jaws at desired times in a cycle of reciprocation of the gripper.

Similarly, the cam 99A through the bell-crank lever 95A and rack 98A effects rotation of gear 100A at different times in the cycle of rotation of gripper frame 89 to effect opening and closing movements of the gripper GA.

The bell-crank levers 95, 95A are biased, as by the springs 101, 101A, to maintain engagement of the cam followers 93, 93A with cams 99, 99A respectively.

The motion of the racks 98, 98A is also utilized to effect operation of the knife mechanisms K, KA which sever the completed packages from the webbing; rack 98A, in addition to maintaining continuous engagement with gear 100A on the reciprocable gripper frame, is continuously in mesh with gear 102A, Fig. 4, on shaft 103A, whose upper end is received by a bearing in the extension 104, Fig. 5, of the standard 105 which is suitably attached to the top of frame member 27 near the front of the machine. Gear 102A is continuously in engagement with gear 106A on shaft 107A extending parallel to shaft 103A and whose lower end is received by a bearing in the frame member 27. Above gear 106A, Fig. 3, shaft 107A extends through the standard extension 104 and through the web-cutting mechanism KA which comprises two knives 109A and 109A guided for reciprocation in a horizontal plane by the structure 110A. The gear 111A on shaft 107A engages a rack integral or attached to the upper blade 109A and gear 112A, also on shaft 107A, engages a rack on the opposite side of the lower blade 109A. Therefore, for rotation of the shaft 107A in one direction the upper and lower knives move toward each other to sever web W1 and for reverse rotation of shaft 107A the knives move from their web-severing position. As more

5/39

clearly appears in Fig. 3, the web W1 passes downwardly through an aperture defined by the cutting or shearing edge at the forward end of the lower blade 108A and the cutting or shearing edge of the upper blade 109A. Consequently, as shaft 107A, Fig. 3, rotates in clockwise direction, both blades move toward the "cutting line" X—X, Fig. 3, to sever the web W1. The mechanism for cutting the web W is similar and the corresponding parts are identified by the same reference characters with omission of the suffix A.

The two cutting heads K and KA are carried by a common member 120 adjustably secured to the standard 105 as by the bolt 119 which extends through an elongated slot in member 120. As indicated in Fig. 5, the cutting heads are adjustable in unison by the hand-wheel 113 at the lower end of a threaded shaft 114 which extends through the stationary frame member 27 and is threadably received by the extension 115 of the support 120 for the two cutting heads.

Provision for vertical adjustment of the cutting heads is not necessary when there is utilized the modified arrangement shown in Fig. 6, which, as previously explained, insures that the frame 66 always has a definite lower position regardless of the adjustment of roller 64 to procure different lengths of package by adjustment of the stroke of frame 66.

As thus far described, the cams 55, 89 and 89A make one revolution per cycle of the machine; the cam 55 effects, during one revolution thereof, one upward and downward stroke of the gripper frame 66; and during one revolution of cams 89, 89A, the grippers are opened and closed, and the knives are closed and opened. As hereinafter more fully described, the webs W and W1 are fed during the downward movement of the gripper frame 66, and at or somewhat before the end of the downward movement of the grippers their jaws are opened to release the webs and the knives sever the webs to detach completed packages which are discharged from the machine by chutes 116, 116A.

The webs W and W1 are often provided with recurrent printing or decorative matter which it is desired shall appear in the individual packages at a definite position similar for all of packages. For various reasons, such as the effect of atmospheric conditions upon the web material during the printing or while in the packaging machine, it is ordinarily not possible to attain exact or substantially exact registration of the printing or decorative matter, exemplified in Fig. 8A, as appearing upon the individual packages, by forming or cutting all packages to exactly the same length.

In the packaging machine shown in Figs. 1-9, there are provided detectors D, DA for inspecting the registration of the printed matter or design on the webs and for advancing or retarding the gripper opening and web-severing operations effected in the next cycle of the machine, thus to correct for inaccuracies of register of the recurrent designs or equivalent as they appear on the web and so avoid cumulation of variations in the spacing between the designs.

In Figs. 7 and 8 there is disclosed a control mechanism responsive to detector DA for shifting the timing of the gripper GA and of the cutting mechanism KA in the cycle of reciprocation of plunger 66; it is to be understood a similar mechanism is utilized to vary the timing of the gripper G and web-severing mechanism K in accordance with the response of a registration detector D (not shown). The cam 89A is slidably keyed to shaft 96A, Figs. 7 and 8, and is provided with a grooved collar 117A for receiving rollers carried by the yoke 118A at the upper end of arm 119A pivoted intermediate its ends on the bracket 122A attached to the frame of the machine. The lower forked ends 121A of the lever 119A embrace pins 122A extending from the member 123A threadably received by the shaft 124A whose ends are supported respectively by aforesaid bracket 122A and bracket 125A. To shaft 124A are attached the spaced ratchet members 126A, 127A. The bell-crank lever 128A mounted upon shaft 124A for angular reciprocation with respect thereto is provided at its upper end with a roller 129A for engaging the groove 130A of cam member 131A secured to shaft 96. The cam groove is so cut and the cam is so positioned on shaft 96A that while the web-feeding plunger 66 is at rest, and therefore while the webs W and W1 are stationary, the bell-crank lever 128A is swung toward and from the position shown in Fig. 7 to effect rotation of shaft 124A in one direction or the other by engagement of one or the other of pawls 132A, 133A, carried by the lower arm of the bell-crank lever 128A with ratchet 126A or ratchet 127A. The arm 134A, secured to the same shaft to which the pawls 132A and 133A are attached, is connected at its lower end, as by link 135A, to the core or armature 136A of a solenoid or equivalent electromagnetic device 137A. The spring 138A compressed between the pawl 132A and the block 139A rotatably mounted in th stationary support 140A biases the pawl 132A into engagement with the ratchet 127A, and concurrently biases the pawl 133A out of engagement with ratchet 127A; therefore, if solenoid 137A is not energized during the aforesaid to and fro movement of the bell-crank lever 128A, the shaft 124A is moved in counterclockwise direction, Fig. 7, during the return stroke of the bell-crank lever to the position of Fig. 7. If, on the other hand, the solenoid 137A is energized during the angular reciprocation of the bell-crank lever, the pawl 133A is pulled by core 136A to engage the ratchet 127A, and during the forward stroke of the bell-crank lever from the position of Fig. 7 effects rotation of the shaft 124A in clockwise direction, Fig. 7.

Upon each of the webs W, W1 is a series of opaque spots or marks O each having the same position with respect to printed or other matter on the web which is to appear in the packages successively cut therefrom; the spacing between adjacent spots, therefore, corresponds to the nominal average length of the packages to be cut from that web. The marks or control elements O may be part of the designs or printing on the web or they may be in addition thereto and, in any event, they possess a distinguishing characteristic suited for the selected type of detector; in the particular arrangements herein disclosed, the light transmission characteristic of the registration marks is different from that of adjacent web portions; for another type of detector, the control elements O may be of electrical conductivity different from that of adjacent web portions; for example, they may be dabs or strips of conductive substance or, less desirably, perforations in the web; in all modifications the detector observes the web while stationary.

Whether or not the solenoid 137A is energized or deenergized at that portion of each cycle of

5/40

the machine during which the bell-crank lever 128 is angularly reciprocated, depends upon the position of a registration mark or control element, specifically an opaque spot O, on the web W1 then stationary, with respect to a beam of light, or other radiation, emitted by the lamp LA, Fig. 9, or equivalent source of radiation, such as an electrically heated resistor, and directed toward a radiation responsive device CA such as a photo-cell, thermocouple, or the like. The photo-cell CA and lamp LA, Figs. 5 and 9, are preferably disposed in individual housings which are closed except for narrow slits in alignment with each other and between which the web W1 passes. The radiation may be concentrated by a suitable optical system comprising one or more mirrors or lenses. If the web W1 at the end of a feeding stroke comes to rest with an opaque spot O, in alignment with the slots or apertures in the two housings, the photo-cell does not receive radiation from the transmitter lamp LA or equivalent and, consequently, in the particular system disclosed, the solenoid 137A is not energized with the result the shaft 124A during oscillation of arm 128A is moved in counterclockwise direction to move cam 98A to the right with respect to the position shown in Fig. 8. Because of the shape of the cam, which is hereinafter described, the result of this change in position is to effect release of the web and severance thereof earlier than before in the next downward stroke of the gripper frame with the results that the package severed from the web is slightly shorter than the preceding package and that a succeeding opaque spot on the web may to greater or lesser extent intercept the path of the radiation from LA to CA. For every subsequent cycle of the machine, the time of release of the grippers will be still further advanced, still further reducing the distance between successively formed seals, until, when the web comes to rest at the end of a feeding stroke, the beam from the lamp L1 is not obscured or is sufficiently less obscured by one of the series of registration marks or control elements O on the web. Thereupon the solenoid 137A is energized during the oscillation of the bell-crank lever 128A with the result that the shaft 124A is rotated in clockwise direction to move cam 98A to the left along shaft 94A and therefore effect release of the grippers and web-severing movement of the knives of cutting head KA later in the downward stroke of plunger 68 with the result the distance between successively formed seals is increased and the package cut in the subsequent cycle of the machine is slightly longer than before; and for every subsequent cycle of the machine, the time of release of the web by gripper GA is more and more retarded still further increasing the distance between successively formed seals until eventually, when the web is at rest at the end of a feeding stroke, an opaque spot O on the web again intercepts sufficient radiation from LA to CA to cause deenergization of the solenoid 137A.

For every cycle of the machine, each of the webs W, W1 is inspected by its respective registration detector D or DA and, in accordance with the position of a registration index or control element O on each web, it is predetermined whether in the next feeding stroke of the individual web, the time of release of the web from its feeding gripper and the time of operation of its individual severing means is made to occur earlier or later in the web-feeding stroke of plunger 68 in effect to shift the location of the containers formed by the sealing operations of the gripper mechanism with respect to the designs on the web between the seals. Thus the proper positioning of the designs on the containers is effected by control of the package-forming mechanism itself and not by any additional mechanism operating upon the web prior to package-forming operations thereon. Although both grippers G and G1 are carried by one and the same reciprocating frame 88, the extents to which the webs W and W1 are fed in any particular cycle of the machine may differ depending upon the prior responses of the detectors D, DA individual to the webs; for example, the response of detectors D and DA while the webs W and W1 are concurrently stationary may be such that in the next downward stroke of the gripper frame the extent of feed of web W is less than in the prior cycle, whereas the extent of feed of web W1 is greater than in the prior cycle, and, in all cases, the extent to which each of webs W, W1 is fed in a particular cycle of the machine is greater or less than the extent of feed in the prior cycle and in the subsequent cycle. The vertical distance from the cutting of each cuting head to the uppermost position of the associated gripper device remains constant for any given adjustment of cutting-head support 138.

In the particular packaging machine shown in Figs. 1–9, the cam 86 is so constructed that, as appears from the timing diagram, Fig. 10, the plunger 68 is at rest in its uppermost position from about zero degrees to about 50° of the machine cycle; consequently, during that part of the cycle the web-clamping devices G, GA, are at rest in their dotted line positions of Fig. 1. During that interval the cam followers 93, 93A ride from the high part of cams 99, 99A, respectively, allowing the springs 101, 101A, to move the racks 99, 99A to the right, Fig. 1, to effect rotation of shaft 70, 71, 70A and 71A, in such direction that the jaws of the clamping devices G, GA close upon the tubes T, TA of web material below the lower ends of the filling tube 16, 16A, thus, as previously described, to seal the upper ends of filled packages and concurrently to form and close the bottoms of containers about to be filled; this same movement of the racks 99, 99A, effects rotation of shafts 107, 107A, in direction to separate the knives of the two cutting heads K, KA, to permit the filled packages as yet unsevered from the web to pass between the knives during the subsequent downward movement of the web-feeding devices G, GA.

The downward movement of plunger 68 and therefore of the web-clamping devices G, GA, begins at about 50° of the machine cycle and continues to about 230° thereof; the length of the plunger stroke, and therefore the maximum possible extent of feed of the webs W, W1, depends upon the setting of the member 84, as previously described.

Each of the barrel cams 99, 99A, is so constructed that during the downward movement of the plunger 68 the cam followers 93, 93A rise from the low part of cams 99, 99A to the high part thereof to effect movement of the racks 99, 99A to the left, Fig. 1, thus individually to effect release of the webs W, W1 from the feeding devices G, GA; and substantially concurrently with release of each web the knife mechanism K or KA operated by the same rack which effects web release severs the web to detach therefrom a filled package. Although both webs W, W1 are concurrently clamped, the time at which each web is

5/41

released and severed during descent of the plunger 68 depends upon the response of the registration-detecting device associated with that particular web, as previously herein described. For example, and again referring to Fig. 10, when the responses of the registration detector D or DA have been such that the cam follower 93 is at the lower end of cam 89 as viewed in Fig. 10, or cam follower 93A near the right edge of cam 89A as viewed in Fig. 8, the cam follower 93 or 93A, as the case may be, meets the rise of the cam early in the downward stroke of the plunger, for example, at about 105° of the machine cycle, thus to effect release of the web and severance of the end package early in the downward movement of plunger 68. To take the other extreme condition, when the prior responses of the registration detector D or DA have been such that the cam follower 93 or 93A is near the other edge of the associated cam 89 or 89A—upper extent of cam adjustment, Fig. 10—the cam follower does not meet the rise of the cam until about 225° of the machine cycle, or just before the bottom limit of the downward stroke of the plunger 68. For intermediate positions of cams 89, 89A, the times of release of the grippers G, GA and of the operations of cutting mechanisms K, KA are correspondingly predetermined. Thus, the extent of feed of each of the webs W, W1, in a particular cycle of the machine, depends upon the positions of the cams 89, 89A with respect to cam followers 93, 93A which positions are subject to individual control by the registration detectors D, DA.

Reverting to Fig. 10, the plunger 68 remains at its lowermost position for a brief time, for example, from about 230° to 240° of the machine cycle, and then returns at accelerated rate to its uppermost position in from about 240° to 360° of the cycle. During the upward movement of the plunger, both sets of gripper jaws are open to clear the filled containers whose upper ends are to be closed by the next clamping movement of the jaws.

In each cycle of the machine two packages are filled and two packages are cut from the webs W, W1; although all packages cut from the webs are approximately of the same length, each package from each of the webs is slightly longer or shorter than the immediately preceding or immediately following package, and the length of a package cut from one web may be either shorter, longer or equal to the package severed from the other web in the same cycle of the machine.

In the modification of my invention shown in Figs. 11–14, packages are formed from two webs packaging material by mechanism similar to that of Figs. 1–9 and for convenience and brevity the corresponding elements of both modifications are identified by the same reference characters. In the modification of Figs. 11–14, there are provided individual feeding plungers for each of the web clamping devices G, GA and the length of stroke of each of these feeding plungers is capable of being adjusted independently of the other in accordance with the response of its associated registration detector D or DA. Moreover, it is also characteristic of the modification of Figs. 11–14, unlike the modification of Figs. 1 to 9, that the time at which each web is clamped, the time at which it is released, and the time at which it is severed all remain the same in all cycles of the machine and are the same for both webs.

Referring to Fig. 11, the two racks 98, 98A of Fig. 1 are replaced by a single rack 998 which engages the gear 100 which controls the opening and closing of the web-clamping device G and also engages gear 100A which controls the opening and closure of the gripper GA. The movement of the rack 998 are controlled by a single non-adjustable cam 800 which replaces the two adjustable cams 89 and 89A of Fig. 1. The periphery of the cam 800 is in continuous engagement with the cam follower 938 carried by arm 940 pivotally connected to the bell-crank lever 95A connected by link 97A to the aforesaid rack 998. The cam 800 is so cut that the jaws of the grippers G and GA close upon the respective webs W, W1 by movement ending at about 55° of the machine cycle and are concurrently opened near the bottom of the strokes of their respective plungers 688, 688A which, in the particular construction shown, are at rest at the bottom of their stroke from about 230° to about 240° of the machine cycle. The rack 998 is also in mesh with gears 102, 102A, Fig. 14, for operating the knives of the web-cutting heads K, KA, as in the modification of Figs. 1–9, so that concurrently with closing movement of the gripper jaws, both sets of knives open to avoid obstruction to the packages about to be fed therebetween, and so that concurrently with opening of the grippers G, GA, the two sets of knives in the heads K, KA, are concurrently operated to sever packages from the webs W, W1.

With the webs W, W1 are associated the individual registration detectors D, DA, similar to those described in connection with Figs. 1–9, each of which control the energization of an electromagnetic device such as solenoid 137A which determines which of the pawls 132A, 133A, is effective during an oscillation of the arm 128A which oscillation is timed to occur in each cycle of the machine while the webs are stationary. If solenoid 137A is energized during oscillation of arm 128A, the cam 880A is moved in one direction along shaft 430, and conversely if the solenoid 137A is not energized during oscillation of arm 128A, the barrel cam 880A is moved in opposite direction axially of its shaft. In like manner, the detector D controls the position of cam 880 longitudinally of shaft 680. The control of the positions of each of barrel cams 880 and 880A of Fig. 11, in accordance with the alignment or misalignment of successive opaque spots or control elements O on the webs W, W1, is effected by an arrangement identical with that shown in Figs. 7 and 8 and previously explained. In the modification of Figs. 13–14, the rotation or angular adjustment of shaft 124A is utilized to shift the position of cam 880A which, as will hereinafter appear, controls the stroke of the gripper GA, whereas, in the modification of Figs. 1–9 the angular adjustment of shaft 124A controls the setting of cam 89A to vary in a cycle of the machine the time of release of the jaws of the web-clamping mechanism GA.

Reverting to Figs. 11, 12 and 13, the periphery of cam 880A is engaged by the cam follower 880 carried by the rack member 898 which is in mesh with the gear sector 600 integral with or attached to the lever 630 to whose free end is connected the roller 84 for engagement with the under surface of the member 86 suitably secured to the feeding plunger 688A. For each revolution of cam 880A the plunger 688A makes one complete cycle of its vertical rectilinear reciprocation; therefore, for each revolution of the cam 880 the web-clamping device G moves to and from its lowermost position from which to the cutting plane of head KA the distance is fixed or predetermined. The length of the stroke of each of

5/42

the plungers 680 680A depends in the particular cycle of the machine upon the axial adjustments of the cams 550, 550A. When cam 550A for example is moved to the right from its position shown in Fig. 11, the length of stroke of the plunger 680A, and therefore the feed of the web W1, is increased and conversely, when cam 550A is moved to the left of its position shown in Fig. 11, the stroke of plunger 680A is shortened to decrease the length of package cut from the web. Although both sets of grippers G and GA open and close at the same time in the cycle of the machine, the extent to which they feed their respective webs depends upon the settings of the cams 550, 550A. The length of stroke of each of the plungers 680, 680A is always either increasing or decreasing, depending upon the responses of the associated registration detectors so to vary the distance between successively formed seals and thus shift the location of the containers formed by the sealing operations with respect to the designs between the seals. In the particular arrangement shown, the length of stroke of each of the plungers is progressively increased for successive cycles of the machine until the registration detector associated with the web observes an opaque spot O on the web while stationary at the end of a feeding stroke; thereupon, the length of stroke is incrementally decreased in the following cycles until, in a subsequent cycle, the registration detector is actuated by partial or complete absence of a control element to effect energization of the solenoid associated with stroke-controlling mechanism for that web, whereupon the length of stroke is again increased.

The construction of cams 550 and 550A is best understood from Figs. 12, 13, 15 and 16. Because these cams are identical in construction, only one of them, cam 550A, needs to be specifically described. Cam 550A throughout its length within the angle between 223° and 240°, corresponding to the bottom dwell of the plunger 680A, is of constant radius, thus insuring that regardless of the axial position of cam 550A the lowermost position of the gripper device GA is always the same; otherwise stated, that segment of the cam corresponding to the portion of the machine cycle between 230° and 240° is a segment of a cylinder. Within the angle between 0° and 50° of the machine cycle for which the plunger 680A is at rest in its uppermost position, the radius of cam 550A progressively decreases from the large end of the cam, Fig. 15, to the small end of the cam, Fig. 16, thus providing for different uppermost positions of gripper device GA in accordance with the responses of the detector DA; this segment of the cam may therefore be considered as a segment of a truncated cone whose maximum radius determines the maximum stroke of plunger 680A and whose minimum radius determines the minimum stroke of the plunger. For each intermediate position of cam 550A with respect to its follower 560, the stroke of plunger 680A is correspondingly predetermined within the aforesaid limits. In the machine described, the ratio of the maximum to the minimum stroke is about two to one; specifically, the maximum stroke is about 6" and the minimum stroke about 3".

From 50° to 230° of every machine cycle, the plunger 680 is moving downwardly but the average speed at which the plunger moves downwardly in a particular cycle depends upon the axial position of cam 550A with respect to the cam follower 560 during that cycle. From 240° to 360° of every cycle of the machine, the plunger 680 is moving upwardly but the [illegible] plunger during this part of a particular cycle depends upon the axial position of cam 550A with respect to its follower 560 during that cycle.

The timing relations of cams 550 and 550A to cam 890 are similar or identical so that both grippers G, GA and both knife mechanisms K, KA operate concurrently in all cycles of the machine. But because of the independence of the axial positions of cams 550, 550A the lengths of the packages cut from the webs W, W1 in any particular cycle of the machine may be and usually are different.

In the modification whose significant components are shown in Figs. 17 to 20, the web W1, from which packages, labels or wrappers are to be cut, is intermittently fed by a gripper mechanism having a constant length of stroke, and proper registry of printed or other matter with respect to the packages or wrappers cut from the web is maintained by shifting the time at which the web is clamped by the gripper mechanism during its return or non-feeding stroke. For brevity and clarity, elements having the same purpose or function as elements of the modification of Fig. 1 are identified by the same reference characters.

For each revolution of cam 55, which rotates once for each cycle of the machine, the plunger 68 carrying the web-gripping mechanism GA makes one cycle of reciprocation. The length of stroke of the plunger, and therefore the maximum feed of web W1 for making packages or labels of desired average or nominal length, is predetermined by the setting of roller 64 in the slotted oscillatory arm 63.

For purpose of explanation of a specific embodiment of this modification, it is assumed that the web W1 is of Cellophane or other transparent or translucent webbing material, and that the recurrent registration marks or control elements O on the webbing are opaque spots.

In front of web W1, adjacent the uppermost position of the web-gripping device GA, indicated by dotted lines in Fig. 17, there is disposed a mirror MA or equivalent for reflecting light from source LA to the photo-cell CA or equivalent, under conditions hereinafter specified, as also does shroud 140 which is to prevent stray light, other than from lamp LA, actuating photo-cell CA. The shroud may either be fixed or reciprocable with the gripper structure GA. The lamp and photo-cell are carried by and move with the gripper mechanism GA during its reciprocation. There is also mounted upon or carried by the gripper mechanism GA and electromagnet 137A, Fig. 18, whose armature 136A is connected by link 135A to a latch 150 whose hooked end engages the pin 151 on arm 152 to restrain the gripper jaws 13a, 19a out of engagement with the web W1. When the solenoid 137A is energized, latch 150 is moved in clockwise direction, as viewed in Fig. 18, to release the arm 152, whereupon the springs 14A, 15A effect closure of the gripper jaws upon the web.

As the gripper mechanism GA approaches the lower limit of its feeding movement, the adjustably fixed cam 153, Figs. 18 and 19, engages the roller 154 on arm 152, causing the arm to move in clockwise direction to the position shown in Fig. 18. Because of the attachment of arm 152 to shaft 70A and of the connection between shaft 70A and 71A effected by the chain 85A and sprockets 84A and 86A on shafts 70A, 71A the gripper jaws are separated by the cams 80A, 81A

5/43

on shafts 78A, 71A to release the web W1. This movement of arm 182 also permits the spring 188 to reset the latch 189 to the position indicated in Fig. 18.

The gripper jaws remain open during the subsequent upward movement of the plunger 86 until radiation from the lamp LA or equivalent is reflected by the mirror MA into the photo-cell, whereupon the electromagnet 137A is energized to effect closure of the gripper jaws upon the web, as above described. The mirror MA should be so located with reference to the nominal normal position of the opaque spot as to overlap it but not to extend below it. For any particular return stroke of the gripper mechanism GA, the time at which the photo-cell receives light from the lamp is dependent upon the position of opaque spot O on the then stationary web with respect to the reflector MA. Because the web is gripped before the end of the return stroke, at least that part of it adjacent the grippers is reversely fed to an extent dependent upon the remaining distance to be travelled by the gripper in its return stroke; with the net result, the actual or forward feed of the web is less than the constant distance in the forward stroke for which the web remains gripped by an amount corresponding with the variable distance, in the immediately prior return stroke, for which the web was, in a sense, reversely fed. For example, if the lower edge of an opaque spot O is approximately at the same level as the lower edge of the mirror, the gripper mechanism must return substantially to its uppermost position before the mirror MA is capable of reflecting light from the lamp into the photo-cell, and accordingly, under this circumstance, the amount of webbing fed or actually advanced by the gripper mechanism in its next downward stroke is appreciably greater than when, for example, the upper edge of an opaque spot O registers with the lower edge of the mirror, in which event the mirror reflects light to the photo-cell substantially before the gripper mechanism GA reaches its uppermost position. In the latter case, the net result of the early closure of the gripper mechanism during its return stroke is that of reduced extent of feed of the web in the next downward stroke of the gripper mechanism. The severing of the web may take place at or within the particular web spacing adjacent the opaque spot observed or at or within a web spacing removed therefrom a predetermined number of spacings.

The variations in the timing of the closure of the gripper mechanism are always such as to maintain an approximately correct register of the printed matter on the packages or wrappers cut from the webbing by web-severing mechanism generally similar to or identical with web-severing mechanism KA of Fig. 1. The length of the opaque spot with the web must obviously be greater than the maximum variations in the length of web spacing.

If desired, the movement of the plunger 86 may, as in the modification of Fig. 1, be utilized to effect feed of more than one web, and in such case, it is to be understood that with each gripper mechanism, there is to be associated an individual control arrangement such as disclosed and described in connection with the single gripper mechanism GA of Figs. 17 to 20.

With the web-feeding mechanism of Figs. 17 to 20 there may be utilized apparatus for forming the web into containers which are filled and sealed before the webbing is cut to detach the filled packages, all as disclosed in the modifications previously described herein; and conversely, it is to be understood the web-feeding arrangements shown in Figs. 1 to 10, and Figs. 11 to 19 may be utilized to cut individual wrappers from the webbing for subsequent use as in a wrapping or packaging machine. For brevity in the appended claims, the term "wrapper", unless inconsistent with the context, is used to comprehend wrappers, labels, or the like, which are applied either before or after their severance from the web.

What I claim is:

1. The method of feeding a plurality of webs having substantially regularly spaced control elements thereon which comprises intermittently and concurrently feeding the webs, while the webs are at rest between successive feeding movements inspecting the positions of control elements thereon, and varying the extents of feed of the individual webs for successive feeding movements thereof each in accordance with the position of the previously observed control element thereof.

2. In web-feeding apparatus comprising reciprocatory web-feeding structure, the method of operation which comprises effecting intermittent concurrent feed of a plurality of webs by successive movements of said structure in one direction, between said successive movements of said structure inspecting the positions of control elements on the webs, and predetermining the extents of feed of the individual webs for each movement of said structure in said direction in accordance with the previously observed control elements on the respective webs.

3. In web-feeding apparatus comprising reciprocatory web-feeding structure, the method of operation which comprises effecting intermittent concurrent feed of a plurality of webs by successive movements of said structure in one direction, between said successive movements of said structure inspecting the positions of control elements on the webs, and releasing the webs individually from said structure in each of said successive movements thereof each in accordance with the position of the previously observed control element thereon.

4. In web-feeding apparatus comprising reciprocatory web-feeding structure, the method of operation which comprises effecting intermittent concurrent feed of a plurality of webs by successive movements of said structure in one direction, between said successive movements of said structure inspecting the positions of control elements on the webs, and varying the times of connection of said structure to the different webs during each of its movements in reverse direction in accordance with the positions of the observed control elements thereon.

5. In web-feeding apparatus comprising reciprocatory web-feeding structures, the method of operation which comprises effecting intermittent concurrent feed of a plurality of webs by successive movements of said structures in forward direction, while said webs are at rest inspecting the positions of control elements thereon, and varying the extents of concurrent forward movements of said structures in accordance with the previously observed control elements on their respective webs.

6. In the art of making wrappers from webs having substantially regularly spaced control elements thereon, the method which comprises intermittently and concurrently feeding the webs

5/44

toward a web-cutting station, at said station concurrently cutting the webs while they are at rest between successive feeding movements thereof, inspecting the webs while at rest between successive feeding movements thereof to detect changes in the positions of successively observed control elements, progressively increasing the extent of feed of each web in successive feeding movements thereof after a control element thereon has been observed at one predetermined position and until a control element thereon is observed at another predetermined position, and thereafter progressively decreasing the extent of feed of each web in successive feeding movements thereof until a control element thereon is observed at said first predetermined position.

7. Mechanism for feeding webs each having thereon substantially regularly spaced control elements comprising feeding means for each of said webs, means cyclically operative intermittently to effect concurrent operation of the several web-feeding means, and registration detectors responsive to control elements upon the different webs for predetermining the extents to which each individual web is advanced during successive cycles of said means.

8. Mechanism for feeding webs each having thereon substantially regularly spaced control elements comprising web-clamping devices for the individual webs, cyclically operated means for reciprocating said devices in unison to effect intermittent feed of the webs, and registration detectors responsive to control elements upon different webs for controlling the timing of the individual web-clamping devices to predetermine the extents to which the individual webs are advanced during successive reciprocations of said devices.

9. Mechanism for feeding webs each having thereon substantially regularly spaced control elements comprising web-clamping devices for the individual webs, cyclically operated means for reciprocating said devices in unison to effect intermittent feed of the webs, and registration detectors responsive to control elements upon different webs for individually varying the extents of movement of said devices during successive cycles of reciprocation thereof.

10. Mechanism for feeding a web having thereon substantially regularly spaced control elements comprising a web-clamping device, means for effecting reciprocation of said device including a rotatable barrel cam and a member engaging the periphery thereof, means for effecting clamping and release of the web by the jaws of said device including a rotatable barrel cam and a member engaging the periphery thereof, and a detector responsive to said control elements for varying the position of one of said cams with respect to its associated member along the axis of rotation of the cam.

11. Mechanism for feeding a web having thereon substantially regularly spaced control elements comprising web-clamping device, mechanism for reciprocating said device, means for effecting operation of said device alternately to clamp and release the web including a rotatable barrel cam and a member engaging the periphery thereof, and a detector responsive to said control elements for varying the position of said cam with respect to said member along the axis of rotation of said cam.

12. Mechanism for feeding a web having thereon substantially regularly spaced control elements comprising a web-clamping device, means for effecting reciprocation of said device comprising a rotatable barrel cam and a member engaging the periphery thereof, mechanism for effecting operation of said device to clamp or release the web, and a detector responsive to said control elements for varying the axial position of said cam with respect to said member to change the extent of reciprocation of said device.

13. Apparatus for making wrappers from a web having thereon substantially regularly spaced control elements comprising a web-clamping device including relatively movable gripper members, a web-cutting device including relatively movable cutting members, mechanism for reciprocating said web-clamping device intermittently to feed the web toward said web-cutting device, a common operating mechanism for said devices effecting web-clamping movement of said gripper members concurrently with separation of said cutting members and web-releasing movement of said gripper members concurrently with web-severing movement of said cutting members, a detector responsive to said control elements, and means controlled in accordance with the responses of said detector when said web is at rest for controlling one of said mechanisms to vary the extents to which the web is fed by successive reciprocations of the web-clamping device.

14. Apparatus for making wrappers from a web having thereon substantially regularly spaced control elements comprising a web-clamping device including relatively movable gripper members, a web-cutting device including relatively movable cutting members, mechanism for reciprocating said web-clamping device in a path of constant length intermittently to feed the web toward said web-cutting device, mechanism for effecting operation of said devices in fixed timed relation to each other during the successive cycles of reciprocation of said web-clamping device, a detector responsive to said control elements, and means controlled in accordance with the responses of said detector when said web is at rest for varying the timing of said second-named mechanism with respect to the reciprocation of said web-clamping device in the successive cycles thereof.

15. Mechanism for making wrappers from a web having thereon substantially regularly spaced control elements comprising a web-clamping device, a web-cutting device, means for reciprocating said web-clamping device intermittently to feed the web toward said web-cutting device, means for effecting operation of said web-cutting and web-clamping devices at fixed times in successive cycles of reciprocation of said web-clamping device, a detector responsive to said control elements, and means controlled in accordance with the responses of said detector when said web is at rest to vary the stroke of said web-clamping device in its successive cycles of reciprocation.

16. Mechanism for making wrappers from webs having thereon substantially regularly spaced control elements comprising web-clamping devices for the individual webs, web-cutting devices for the individual webs, means for reciprocating said web-clamping devices in unison intermittently to feed the webs toward their respective web-cutting devices, and detectors responsive to control elements of the individual webs for controlling the times of operation of the clamping and cutting devices of the individual webs in each cycle of reciprocation of said cutting devices.

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5/45

Plaintiff's Exhibit 5

May 14, 1940. J. R. SONNEBORN ET AL. 2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

Filed March 4, 1939 5 Sheets-Sheet 1

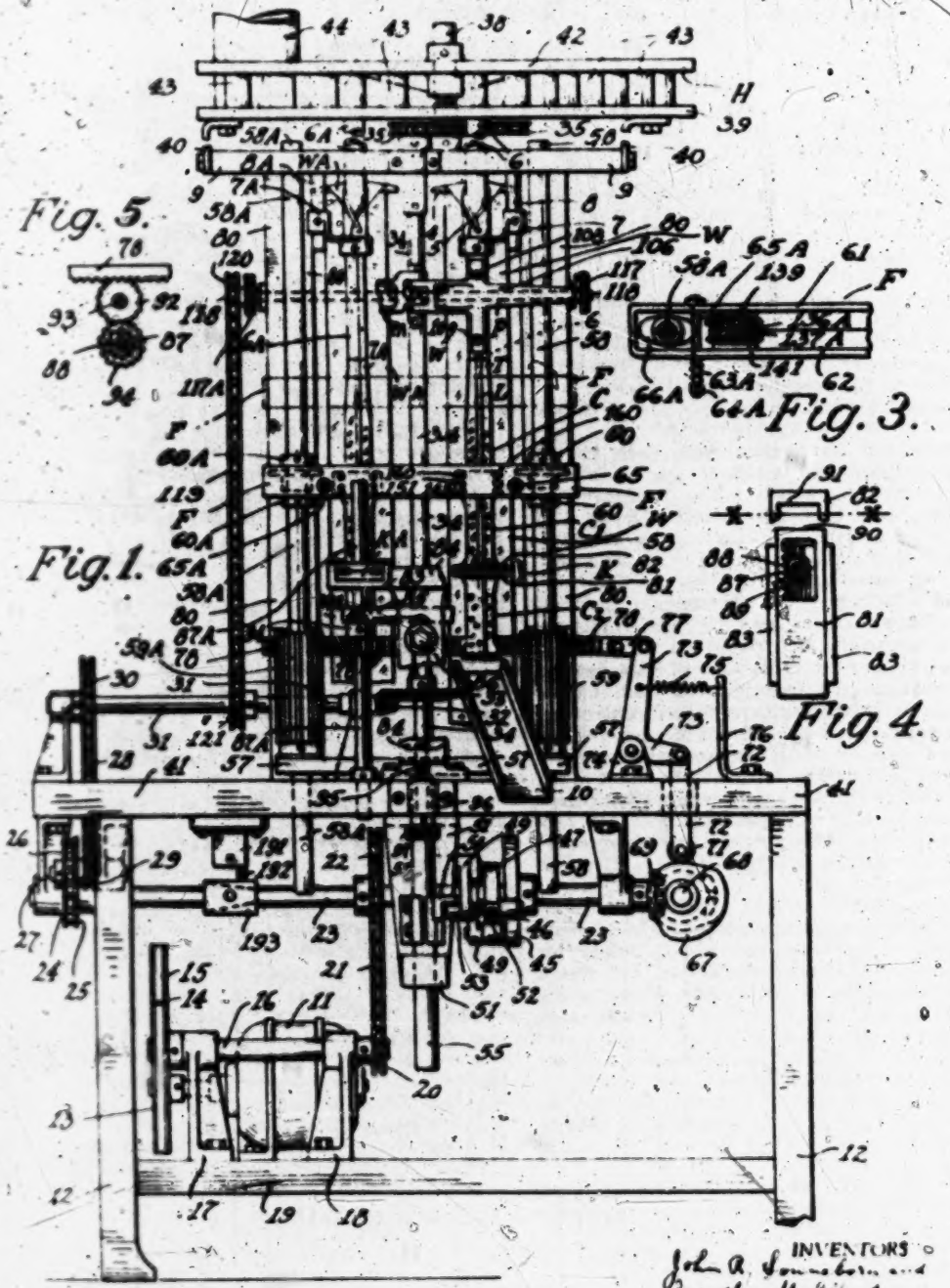

Fig. 5.

Fig. 1.

Fig. 3.

Fig. 4.

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5/65

Plaintiff's Exhibit 5

May 14, 1940. J. R. SONNEBORN ET AL. 2,209,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

Filed March 4, 1939 5 Sheets-Sheet 2

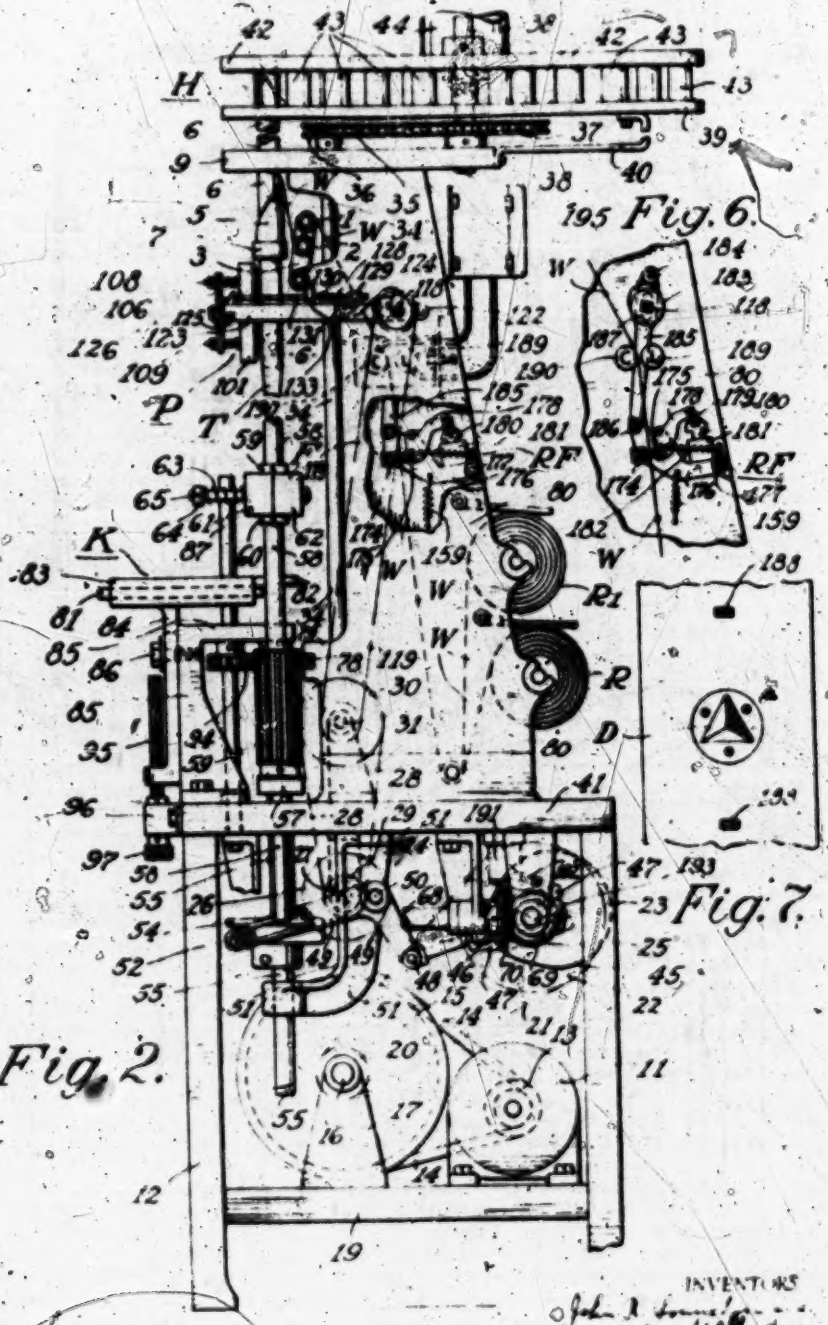

Fig. 2.

Fig. 6.

Fig. 7.

INVENTORS

BY

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Plaintiff's Exhibit 5

May 14, 1940. J. R. SONNEBORN ET AL 2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

Filed March 4, 1939 5 Sheets-Sheet 3

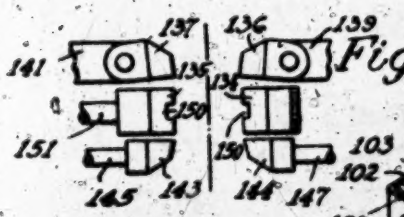

Fig. 11.

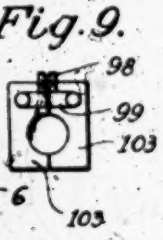

Fig. 9.

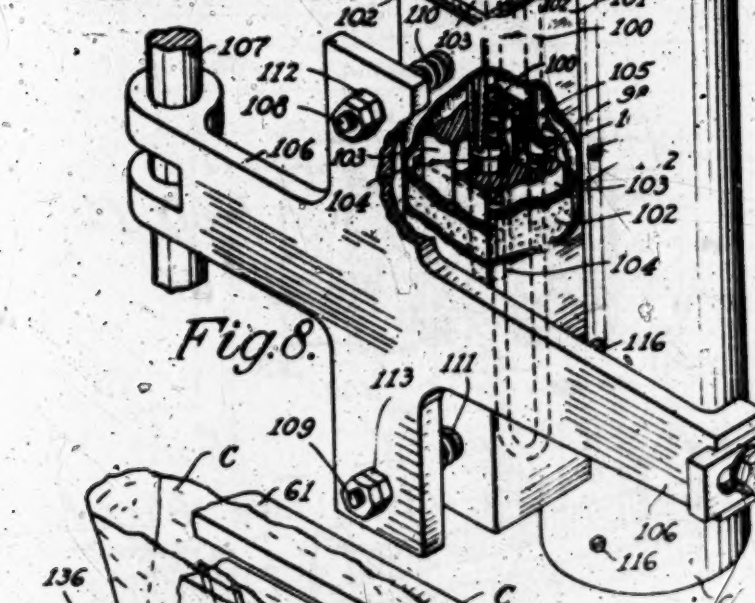

Fig. 8.

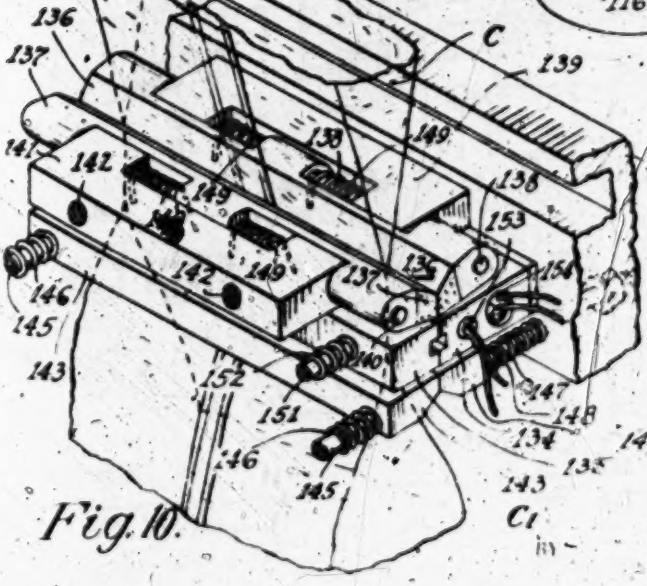

Fig. 10.

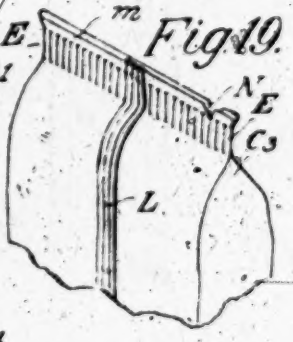

Fig. 19.

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5/67

Plaintiff's Exhibit 5

May 14, 1940. J. R. SONNEBORN ET AL. 2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

Filed March 4, 1939 5 Sheets-Sheet 4

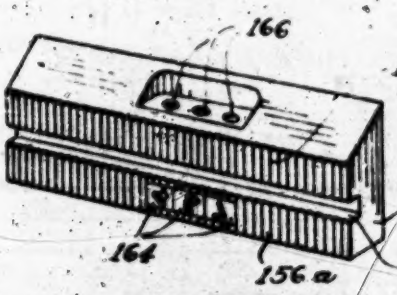

Fig. 13.

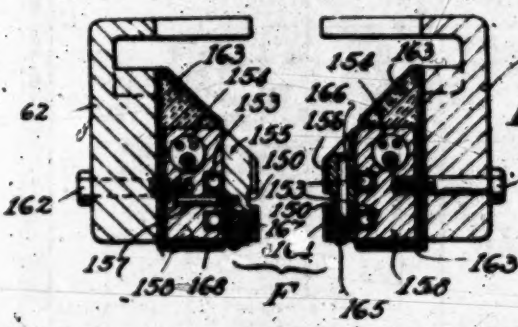

Fig. 12.

Fig. 14.

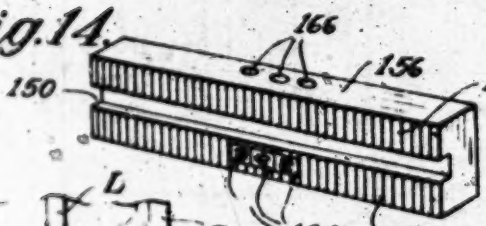

Fig. 15.

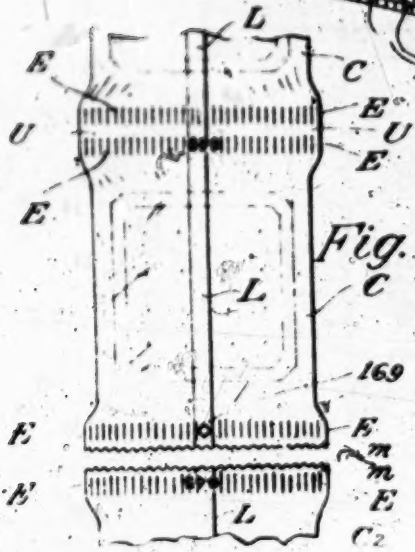

Fig. 16.

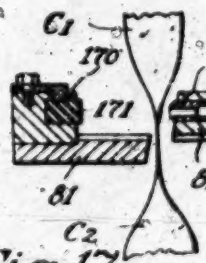

Fig. 17.

Fig. 18.

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5/68

Plaintiff's Exhibit 5

May 14, 1940. J. R. SONNEBORN ET AL 2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

Filed March 4, 1939 5 Sheets-Sheet 5

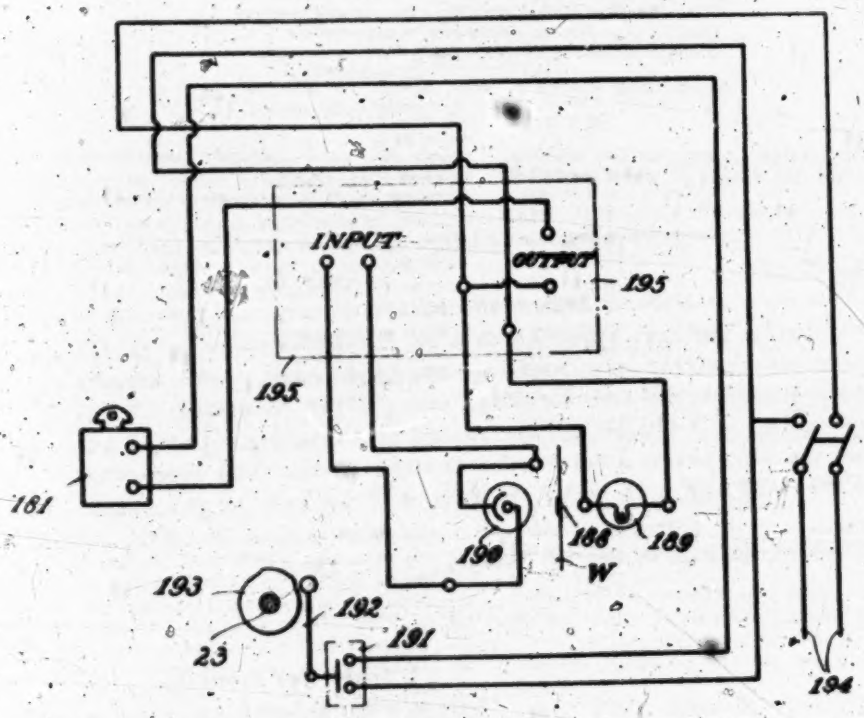

Fig. 20.

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5/70

Plaintiff's Exhibit 5

Patented May 14, 1940 2,200,971

UNITED STATES PATENT OFFICE

2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

John R. Sonneborn, Willow Grove, and Jonathan Y. Albertson, Philadelphia, Pa., assignors to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application March 4, 1939, Serial No. 259,748

58 Claims. (Cl. 93—3)

Our invention relates to systems for making, filling and sealing containers of sheet material, shows details of transverse seal-forming mechanism of Figs. 1 and 2;

CERTIFICATE OF CORRECTION.

Patent No. 2,200,971. May 14, 1940.

JOHN R. SONNEBORN, ET AL.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, line 3, and in the heading to the printed specification, address of assignee, after "Summerdale," insert --Philadelphia,--, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of January, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

Our invention further resides in the methods and features of combination, construction and arrangement, hereinafter described and claimed.

For an understanding of our invention, reference is to be had to the accompanying drawings, in which:

Fig. 1 is a front elevational view, with parts broken away, of a machine for making, filling and sealing containers;

Fig. 2 is a side elevational view, with parts broken away, of the machine of Fig. 1,

Fig. 3 is a fragmentary plan view of web-gripping and seal-forming mechanism shown in Figs. 1 and 2;

Fig. 4 is a plan view of web-severing mechanism shown in Figs. 1 and 2;

Fig. 5 is a detail view, in plan, of parts of the driving mechanism for the web-severing device of Fig. 4;

Fig. 6, on enlarged scale, illustrates a web-registering mechanism shown in Fig. 2;

Fig. 7 is a face view of web material;

Fig. 8, in perspective, and with parts broken away, shows, on enlarged scale, seal-forming mechanism of the apparatus of Figs. 1 and 2;

Fig. 9 is a plan view of parts appearing in Fig. 8;

Fig. 10, in perspective and on enlarged scale, method of and a machine for [illegible] sealing containers, which machine is generally similar to that shown in Zwoyer U. S. Patent #1,986,422; web material W is fed from one or more rolls R, R1 over idler rolls 1, 2, carried by arm 3 biased as by a spring, not shown, to maintain suitable tension on the web, and is shaped into tubular form by the tools 4 and 5 of construction more fully disclosed in aforesaid Zwoyer patent, about the hollow tube or forming member 6 supported by bracket 7 adjustably secured to the rod 8 depending from the upper frame member 9 of the machine.

The overlapping margins of the web W are joined by a longitudinal seal-forming device P whose construction and action are hereinafter more fully explained, thus to form a closed tube T of web material with a seal L longitudinally thereof. Below the lower open end of the form 6, the tube T of web material is flattened by the jaws of a vertically reciprocating tube-closing or package-forming mechanism F, of construction hereinafter more fully explained. Closure of the jaws of the device F produces a seal F transversely of the tube, concurrently to form the bottom of a container C which is filled through the form 6, and to close the upper end of a previously filled container C1.

5/54

Plaintiff's Exhibit 5

Patented May 14, 1940

2,200,971

UNITED STATES PATENT OFFICE

2,200,971

SYSTEM FOR MAKING, FILLING, AND SEALING CONTAINERS

John R. Sonneborn, Willow Grove, and Jonathan Y. Albertson, Philadelphia, Pa., assignors to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application March 4, 1939, Serial No. 259,748

58 Claims. (Cl. 93—3)

Our invention relates to systems for making, filling and sealing containers of sheet material, particularly thermoplastic web material such as Pliofilm, moistureproof Cellophane, and the like.

In accordance with one aspect of our invention, while making a tubular or equivalent container the overlapping longitudinal margins of the web material are joined by heat and pressure applied while the web material is not under tension or is at rest, to insure uniformity and permanence of the resultant seal throughout its length.

Further in accordance with our invention, while the web material is being pulled over a form to shape it into a tube, heat and pressure are applied to form a seal transversely of a previously formed tube while the latter is, preferably at least locally, substantially free of tension; more particularly, the heated material of the transverse seal is relieved of feeding tension by limiting application of the feeding tension to the tube or web material to a region between the transverse seal and aforesaid form; and/or, additionally, the transverse seal, at least within the period of its formation, preferably is relieved of the tension due to the weight of the previously formed and filled container closed by and otherwise depending from aforesaid transverse seal.

Our invention further resides in the methods and features of combination, construction and arrangement hereinafter described and claimed.

For an understanding of our invention, reference is to be had to the accompanying drawings, in which:

Fig. 1 is a front elevational view, with parts broken away, of a machine for making, filling and sealing containers;

Fig. 2 is a side elevational view, with parts broken away, of the machine of Fig. 1;

Fig. 3 is a fragmentary plan view of web-gripping and seal-forming mechanism shown in Figs. 1 and 2;

Fig. 4 is a plan view of web-severing mechanism shown in Figs. 1 and 2;

Fig. 5 is a detail view in plan of parts of the driving mechanism for the web-severing device of Fig. 4;

Fig. 6, on enlarged scale, illustrates a web-registering mechanism shown in Fig. 2;

Fig. 7 is a face view of web material;

Fig. 8 is perspective, detail with parts broken away, on enlarged scale, seal-forming [illegible] of the apparatus of Figs. 1 and 2;

Fig. 9 is a plan view of parts appearing in Fig. 8;

Fig. 10 is perspective and on enlarged scale [illegible] shows details of transverse seal-forming mechanism of Figs. 1 and 2;

Fig. 11 is an end elevational view illustrative of the relation between web-gripping elements appearing in Fig. 10;

Fig. 12 is a sectional view and modification of the seal-forming mechanism shown in Fig. 10;

Fig. 13 is a perspective view of one of the sealing elements of Fig. 12;

Fig. 14, in perspective, illustrates a modification of the sealing element of Fig. 13;

Fig. 15, in perspective, shows a fragmentary view of a further modification of the sealing element of Fig. 13;

Fig. 16 is a front view of packages sealed by the elements of Figs. 12 to 14;

Fig. 17 is a sectional view in end elevation of mechanism for severing and punching the package seals;

Fig. 18 is a fragmentary front elevational view of one of the web-severing elements of Fig. 17;

Fig. 19, in perspective, shows one end of a filled package made by the mechanism of preceding figures;

Fig. 20 is a wiring diagram of the elements of a web-registering system.

Referring to Figs. 1 and 2, illustrative of our method of and a machine for making, filling and sealing containers, which machine is generally similar to that shown in Zwoyer U. S. Patent #1,986,422, web material W is fed from one or more rolls R, R1 over idler rolls 1, 2, carried by arm 3 biased as by a spring, not shown, to maintain suitable tension on the web, and is shaped into tubular form by the tools 4 and 5, of construction more fully disclosed in aforesaid Zwoyer patent, about the hollow tube or forming member 6 supported by bracket 7 adjustably secured to the rod 8 depending from the upper frame member 9 of the machine.

The overlapping margins of the web W are joined by a longitudinal seal-forming device P whose construction and action are hereinafter more fully explained, thus to form a closed tube T of web material with a seal L longitudinally thereof. Below the lower open end of the form 6, the tube T of web material is flattened by the jaws of a vertically reciprocating tube-closing or package-forming mechanism F, of construction hereinafter more fully explained. Closure of the jaws of the device F produces a seal E transversely of the tube, concurrently to form the bottom of a container C which is filled through the [illegible] and to close the upper end of a [illegible] filled container C1.

Downward movement of the device F from the position indicated in broken lines, Fig. 1, pulls further web material over the form 6 to form a further section or increment of tubing T and to bring the longitudinal margins of further web material adjacent the sealing device P, at the end of the downward movement of the mechanism F, the transverse seal E previously formed between two filled containers C1, C2 is brought into the path of movement of the blades of a web-severing device K, whose mechanism is hereinafter more fully described, which operates substantially concurrently with release of the web material by the mechanism F to cut through the seal between the containers C1, C2 and so detach filled container C2 from the web material. The detached container slides from the machine along the chute 10.

The particular machine shown is a dual unit; while the aforesaid cycle of operations are being performed upon web material W, the same sequence of operations is being performed by similar mechanism upon the web WA; because the mechanism for operating upon web WA is essentially a duplicate of that described for operating upon web W, its components are identified by the same reference characters plus the letter A.

The web-feeding and web-severing mechanisms are driven by motor 11 supported by the frame 12 of the machine; the pulley 13 on the motor shaft is connected, as by belt 14, to the pulley 15 on one end of a shaft 16 supported by brackets 17, 18 attached to the frame member 19 of the machine; to the other end of shaft 16 is attached a sprocket 20 which, through chain 21, drives a sprocket 22 on the main control shaft 23 of the machine.

The feeding head or turret H which segregates measured amounts of filling material for delivery into the forming tubes 6, 6A, is driven from shaft 23 through the chain 24 which connects sprockets 25 and 26 on shaft 23 and jackshaft 27, chain 28 which connects sprocket 29 on shaft 27 with sprocket 30 on shaft 31, bevel gear 32 on shaft 31, bevel gear 33 on shaft 34, and chain 35 connecting the sprocket 36 on the upper end of shaft 34 below the feeding head H to the sprocket 37 on shaft 38 of feeding head H. The particular feeding head shown, which may be replaced by others for different characters of filling for the containers, comprises a stationary plate 39 suitably held as by the brackets 40 to the frame member 9 of the machine, and is provided with openings in registry with or receiving the upper ends of the web-shaping tubes 6, 6A. The plate 42 of the head, which is attached to shaft 38, serves as a support for the open-ended measuring tubes 43 received by or in registry with openings through the plate 42, and also serves to prevent escape of material from the hopper 44 except as provided by the openings through the plate 42 into the measuring tubes 43.

The movement of the turret or feeding head H, preferably so timed that material is discharged through the forms 6, 6A into the tubes T, T1 of web material substantially at the end of each feeding stroke of the package-forming and web-feeding devices F, FA.

Reciprocation of the web-feeding device F is controlled by the cam 45 attached to the main shaft 23 of the machine; the periphery of cam 45 is engaged by the cam follower or roll 46 journaled from the member 47 having a forked end embracing the shaft 23 and pivotally connected at 48 to one arm of a bell-crank lever 49 pivotally mounted at 50 upon the bracket 51 depending from the frame member 41 of the machine. The other arm of bell-crank lever 49 is slotted for adjustment of the supporting pin 52 of the roller 53 which engages the under surface of the ledge member 54 adjustably secured to the plunger 55 guided at its lower end by the bracket 51 secured to the under side of aforesaid frame member 41 and passing through the frame member 41 for connection to the cross-member 57 through which passes the shafts 58, 58A to which are secured, respectively, the elongated gears 59, 59A whose lower ends serve to receive the thrust of member 57 and transmit it to the shafts 58, 58A. The collars 60, 60 on shaft 58, and collars 60A, 60A on shaft 58A, serve to support the opposite ends of the package-forming mechanism F and permit rotation of the shafts 58, 58A for the purpose hereinafter described.

As the cam 45 rotates, once for each cycle of the machine, the bell-crank lever 49 is oscillated to effect reciprocation of the member 57 to and from its lowermost position, shown in full lines in Figs. 1 and 2, and consequently the package-forming mechanism F, supported by the member 57 through the intermediary of shafts 58, 58A and gears 59, 59A, moves between its limits indicated by the full and broken line positions, Fig. 1.

The length of the stroke or extent of vertical reciprocation of the package-forming mechanism F may be varied to obtain containers of different lengths by adjustment of supporting pin 52 of the roll 53 in the slotted end of the bell-crank lever 49.

The package-forming structure F comprises two members 61, 62 which are biased toward or into engagement with each other by the springs 63, 63A; as more clearly appears in Fig. 3, the spring 63A is compressed between the member 62 and a collar 64A on a bar or pin 65A which passes freely through the member 62, near the left end thereof, and is attached to the member 61 at the corresponding end. The right-hand ends of the members 61, 62, Fig. 2, are similarly biased toward each other by spring 63.

The cam 66A, suitably attached to shaft 58A between the members 61 and 62, is adapted, upon rotation of shaft 58A, to separate the left ends of members 61, 62, and concurrently a similar cam 66 (not shown) on shaft 58 separates the other ends of the members 61 and 62, to extent sufficient to permit the web-engaging elements hereinafter described to clear the containers when the package-forming structure F is moved upwardly to the dotted line position of Fig. 1.

The movements of the members 61, 62 toward and away from each other by rotation of the shafts 58, 58A, is controlled by the cam 67 on shaft 68 driven from the main shaft 23 through the gears 69 and 70. The cam follower 71, which continuously engages the periphery of the cam 67, is supported at the lower end of a bar 72, guided by a slot in the frame member 41, and pivotally connected at its upper end to one arm of a bell-crank lever 73 pivotally mounted upon bracket 74 and biased to the position shown in Fig. 1 by the spring 75 extending from bracket 76. The other arm of bell-crank lever 73 is connected by link 77 to a rack 78, received by guide 79 in the vertical frame members 80 of the machine, and continuously in mesh with the gears

5/56

59, 59A throughout their reciprocation with the plunger 65.

The cam 67 is preferably adjustable, as indicated in Fig. 1, to permit variation in the timing of movements of the members 61, 62.

The same cam 67 is utilized to control operation of the web-severing mechanisms K, KA which are identical in construction, such as more fully disclosed in aforesaid Zowyer patent. Briefly, the web-severing device K comprises two blades 81, 82 guided during their concurrent movements in opposite directions by the frame member 83, attached to or forming an integral part of the support 84 adjustably clamped to the bracket 85 by bolt 86 which extends through a slot 86' in the support. Each of the blades 81, 82 is provided with a rack for operation by a gear on shaft 87; specifically, as shown in Fig. 4, the gear 88 on shaft 87 is in mesh with rack 89 of blade 81, so that oscillation of shaft 87 causes the cutting edge 90 of the blade 81 to move toward and away from the cutting line x—x; similarly, a rack (not shown) on the other side of the center of shaft 87 provides for movement of the cutting edge 91 of blade 82 toward and away from the cutting line x—x; consequently, for rotation of shaft 87 in one direction, the cutting edges 90, 91 of blades 81, 82 move toward each other to detach a filled container, and for rotation of shaft 87 in opposite direction, the blades move away from each other to clear the filled container next to be detached.

Movement of the shaft 87, and of the similar shaft 87A which controls the corresponding knives 81A, 82A of the cutting head KA, is produced by reciprocation of the rack 78. As shown in Fig. 5, rack 78 is in mesh with a gear 92 on the shaft 93 supported between bracket 85 and frame member 61, Fig. 2; and gear 92, in turn, is in mesh with gear 94 on shaft 87; by a similar arrangement, rack 78 is operatively connected to shaft 87A. The gears within the cutting heads K, KA are slidably keyed to the shafts 87, 87A to maintain continuous driving connections between the shafts and the knives as the heads K, KA are adjusted to the desired vertical position. Preferably as shown in Fig. 2, the support 84 for the heads K, KA threadably engages a screw 95, which passes through a bracket 96 secured to the front of the machine, and is provided with a suitable operating knob 97.

As thus far described, the operation of the mechanism is similar to that of aforesaid Zwover patent to which reference is made for further details of description.

In the machine of aforesaid Zwoyer patent, the overlapping margins of the web material are joined to form a seal longitudinally of a tube of web material by heated transverse wire elements on the periphery of a disc mounted for rotation by the frictional engagement between the wire elements and the web margins. When the web is of Pliofilm, or like material, particularly when a rubber derivative, the seal so formed is not satisfactory for many purposes because not uniform, because the heated wire elements form a surface comprising in effect ridges spaced by depressions, and the heating of the web material is correspondingly greater at localized transverse regions separated by regions which have been subjected to lesser heat and/or pressure.

With the aforesaid prior arrangement, the time of engagement between any particular increment of the seal and the heated wire element which produces it is very brief, and while that increment is soft due to the heat applied, it is subjected to and distorts because of the feeding tension applied to the web.

Our improved arrangement for joining the web margins is most clearly shown in Fig. 8, and the operating mechanism therefor is most clearly shown in Fig. 2. The hot sealing member which engages the overlapping web margins is an elongated plate or strip 98 of metal or other good conductor of heat, whose web-engaging surface is at least longitudinally of the seal, uniformly smooth, in the sense it is devoid of aforesaid ridges and depressions, so effects uniform application of heat and pressure to the web margins to effect a seal, wholly continuous and uniform throughout. The strip 98 is integral with or suitably attached to a metal bar or plate 99 which, in the particular arrangement shown, has edges grooved (Fig. 9) snugly to receive electrical heater element 100 which may be of any suitable construction, such as a coil of heater wire wrapped about a core and disposed within a suitable casing of electrical insulation. The casing 101 of the heater unit is preferably lined with sheets 102 of asbestos or other heat-insulating substance. To provide the heat storage capacity necessary for stabilizing of the temperature of the sealing element 98 which, as hereinafter appears, is intermittently used to perform sealing operations, there are provided relatively massive metal blocks 103 preferably in direct contact with the metal bar 99 and insulated from the housing 101 by aforesaid strips 102 of heat-insulating material.

The thermostatic device 104, which is adjustable as by screw 105 to maintain a desired temperature of sealing element 98, is disposed within a well formed by recesses in and subjected to the temperature of the metal blocks 103. Thermostatic device 104 may be of any known type or construction, and may be used in any known manner to control the electrical energy supplied to the heater 100; for example, the contacts of the thermostat may be electrically in series with heater 100.

Preferably, the sealing unit P is yieldingly mounted upon a supporting frame 106 pivotally mounted upon bar 107 extending vertically and downwardly from the frame member 9 of the machine; in the particular construction shown, the resilient mounting is afforded by studs 108, 109 which pass loosely through the frame 106 into the housing 101 which is biased away from the frame by the springs 110, 111 encircling the studs. The nuts or equivalent stops 112, 113 on the studs limit the movement of the housing 101 by the biasing springs.

Movement of the frame 106 in counterclockwise direction toward the form 6, Fig. 8, effects engagement of the heated sealing member 98 with the overlapping margins of the web material, and continued movement of the member 106 increases the pressure exerted by the heated sealing member 98 on the margins.

Preferably the margins are not pressed directly against the tube 6; instead there is provided an insert 114 of suitable yielding material, for example "Neoprene", a synthetic rubber, suited to maintain its properties at the heat-sealing temperatures involved. The yielding strip 114 is backed by the metal bar 115 secured, as by screws 116, within the forming tube 6.

To effect engagement of the sealing member 98 with the web margins while the web material is free of tension, or at rest between [illegible]

5/57

movements, and to move the heated element 88 from contact with the web material shortly before the beginning of the next web-feeding movement, there is provided a cam 117, Fig. 2, secured to shaft 118 driven from shaft 31 by chain 119 which drives sprocket 120 on shaft 118 and is driven by sprocket 121 on shaft 31. In the particular arrangement shown, the cam 117 makes one revolution per cycle of the machine. The periphery of the cam 117 is engaged by cam follower 122 on link 123 which is supported in horizontal position by engagement with shaft 113 which passes through a slot 124 in the link. To facilitate disconnection of the swinging frame 106 from the link 123 for access to the heater unit, or for any other reason, the latter is provided with a slotted end which hooks over a pin 125 which may be directly carried by the support 106 or, as shown in Fig. 8, may be carried by the element 126 adjustably attached as by bolt 127 to the support 106. The spring 128 for effecting movement of the sealing element 88 away from the forming tube 6 is compressed between the stationary stop 129 and a collar 130 or equivalent on the rod 131 which passes through the stop 128 and the guide 133 attached to the frame member 80. The forward end of the rod 131 continuously bears against aforesaid element 126 attached to arm 106 and maintains engagement of cam follower 122 with cam 117.

By adjustment of the member 126, there is predetermined the limits of movement of the arm 106 and therefore the duration of contact in each cycle of the machine, of the sealing element 88 with the overlapping seam-forming margins; this adjustment also affects the degree of pressure applied by the sealing element 88 to the seam margins, although an independent adjustment of the pressure may be effected by variation of the compression of the springs 110, 111.

The construction shown in Fig. 8, therefore, permits adjustment of the temperature and pressure applied by the sealing element 88 to the overlapping margins, and also of the duration of engagement of the sealing member 88 with the margins; consequently, there can be chosen those concurrent conditions of time, temperature and pressure which afford optimum sealing results for particular compositions and thicknesses of web materials.

The arrangement shown in Fig. 8 is particularly suited for operation upon Pliofilm and other derivatives of rubber, or like materials, because that type of material, while softened by heat or during formation of the seal, stretches or otherwise deforms, yielding a non-uniform or non-homogeneous or misshapen, and sometimes discolored seal, unless during formation of the seal its components are free of stress or web-feeding tension. Our said arrangement, however, is not limited to use on aforesaid materials, derivatives of rubber, or materials similar thereto in the sense they stretch or otherwise deform when under tension while heated; but is satisfactory also for other thermoplastics such as moisture-proof Cellophane, Diafane, Sylphwrap and other materials thermoplastic because impregnated with, coated with, or consisting of thermoplastic material.

It is to be understood the device PA for joining the overlapping margins of the web WA, Fig. 1, is of similar construction and is similarly operated. Corresponding elements are identified by the same reference characters with addition of the letter A.

In the machine of aforesaid Zwoyer patent, the transverse seals dividing the tube of web material into separate containers are formed by heated gripper jaws carried by elements similar to present members 61, 62, of the package-forming structure F, which serve also to apply feeding tension to pull further web material over the forming tube 6. Particularly with Pliofilm and like materials which readily stretch or deform when heated, this mode of feeding the web material results in stretching of the heated web material at and adjacent the seal, so weakening it that accidental breakage at or adjacent the seal is often responsible for loss of the container contents; stretching of the material also affects the feeding of the web and causes dissimilarity of appearance of recurrent web designs on the completed containers.

With our improved arrangement shown in Fig. 10, the transverse seal E, during its formation by the heated sealing member 134 coacting with relatively cold anvil 135, is relieved of web-feeding tension by auxiliary web-clamping members 136, 137, Figs. 10 and 11, carried, respectively, by the members 61, 62 of the package-forming structure F. Preferably the members 136, 137 are pivotally mounted, are biased by spring 140 to swing away from the web upon retraction of members 61, 62 from the web material, and have web-engaging faces which are downwardly inclined toward the web. When the members 61, 62 move toward each other, under the control of cam or cams 66, 66A, as above described, the members 136, 137 flatten the tube T; when their lower edges meet sufficient resistance by opposing each other through the webbing, the members 136, 137 for their further approach swing downwardly about their respective pivots firmly to clamp the web and also to produce a slight amount of slack in the web below the gripper members 136, 137 and above the heat-sealing tools 134, 135. During feed of the web material, by downward movement of structure F, it is therefore locally relieved of feeding tension at the transverse seal; the feeding tension is applied by the unheated members 136, 137 which clamp the web material above the transverse seal and below the form 6.

As shown in Fig. 10, the gripper jaw 136 is supported by pin 138 which passes through the legs of a U-shaped block 139 attached to the inner face of the member 61; similarly, the gripper jaw 137 is pivotally mounted upon pin 149 which passes through a U-shaped block 141 attached to the member 62 by bolts 150 which screw into the holes 142, 142.

To relieve the material of the seal, while heated for seal-formation, from tension due to the weight of a filled container otherwise suspended directly from it, there is provided another pair of gripper elements 143, 144, Figs. 10 and 11, supported respectively by the frame members 61, 62 of the package-forming structure F. The gripper member 143 is supported suitably below the heat-sealing elements 134, 135 by the pins 145, 145 which extend loosely through the supporting member 62. The springs 146 are compressed between the members 143 and 62 to bias the former toward the web material. The auxiliary gripper member 144 is similarly mounted upon a pair of pins 147 which pass through the frame member 61 of the structure F and are biased toward engagement with the tube T of web material by springs 148.

The provision of both sets of auxiliary gripper

5/58

136, 137 and 143, 144 insures the heat seal is, during its formation, entirely free of tension and so insures uniformity and strength of the seals.

Although particularly suited for web materials such as Pliofilm, and the like, which deform when pulled while heated, the same composite web-gripping arrangement may be used without modification for other thermoplastic web materials such as Cellophane, Diafane and the like.

A similar arrangement of heat-sealing elements, and auxiliary grippers for relieving the seal of tension, forms seals transversely of the web WA; the web-feeding grippers 136A, 137A appear in Fig. 3.

Particularly for Pliofilm and like derivatives of rubber and the like, it is desirable the face of each of the seal-forming elements 134, 135 be divided as by a longitudinal notch 150 so that, instead of a single wide seal, there are formed two seals E, E joined by an unsealed transverse section U, Fig. 16; the unsealed section U is so located that the cutting head K in detaching a filled container from the web material cuts through the unsealed section. As a result, at least one end of each filled package, Fig. 19, has beyond its end seal E a narrow unsealed margin m to facilitate opening of the package. When Pliofilm containers in particular are sealed to the edge, attempts to open the container at the seal often result in rupture of the container at some other point, with loss of at least some of its contents or filling.

One of the seal-forming members 134 may be rigidly attached to its support 81, and the other seal-forming member 135 may be yieldingly mounted to its support 82, as by pins 151 and springs 152. In the particular arrangement shown, Fig. 10, the element 134 is provided with an elongated bore or cavity to receive an electric heater 153; for control of the temperature of the heater there may be provided a thermostatic switch 154 disposed within a well in the sealing tool 134.

In the modification of the package-forming and web-feeding structure F shown in Fig. 12, the metal elements 135, 136 which engage the web to form the transverse seal when the members 81, 82 are moved toward engagement with each other are detachably held, as by screws 157, to the metal blocks 158, 159 whose adjacent faces are each grooved to receive an electric heater element or elements 153 whose temperature is preferably controlled by a thermostatic switch 154 responsive to the temperature of block 158. The blocks 158, 159 are in turn held to the members 81, 82 by bolts 161, 162.

During formation of a seal, the web material forming the body of the container is protected from the heated seal-forming elements 135, 136 by the guard members 163, 163 which may be of thin sheet metal bent substantially as shown in Fig. 12. The space between each of the members 158 and its associated guard 163 is preferably filled with a suitable heat-insulating material such as asbestos or the like.

To mark the containers concurrently with formation of a seal, one of the sealing elements, for example 136, is recessed to receive the insert or inserts 164, preferably of metal whose web-engaging face or faces is or are provided with markings such as letters, numerals, or other characters, to be impressed in the seal concurrently with its formation. The inserts 164 are held in place by screws 166, and may be removed from the sealing element 136 by inserting a tool or punch, with a wedge-shaped end, through the openings 166 which extend downwardly from the upper face of the block 156 adjacent the rear of the inserts 164.

Preferably the element 167, carried by the other sealing element 135 for coaction with the inserts 164, is of resilient or yielding heat-withstanding material such as Neoprene, and is protected from excessive heating by a backing 168 of asbestos or the like. By this arrangement concurrently with formation of a seal forming one or the other end of a package, a suitable identifying mark or characteristic is impressed in the seal.

The inserts 164, 167 are so located that the markings to be individual to a package are not divided by the knives 81, 82 when they cut through the tube T of web material to detach a filled container; in the types of sealing elements shown in Figs. 12, 13 and 14, the inserts 164 are so located that the markings impressed thereby appear entirely in the lower of the two seals E, E, Fig. 16, concurrently formed when the members 81, 82 move toward each other. When the sealing elements are not provided with grooves 150, Fig. 15, they form a single wide seal, which is subsequently divided by the knives 81, 82; but again the inserts 164 are so positioned the markings impressed thereby ultimately appear entirely within one or the other of the two end seals of a package.

As indicated in Figs. 16 and 19, either or both of the transverse seals E, E may be corrugated; the corrugations may be effected by the indicated corrugations of the faces 155a of members 155, Figs. 13 and 14.

When it is desired to suspend the packages or filled containers from hooks for display purposes, the eyes 169, Fig. 16, individual to the containers for so suspending them, may be formed concurrently with separation of a filled container from the web material by the blades 81, 82. To the upper face of the lower blade 81 is attached a block 170, Fig. 17, having an insert or facing 171 of yielding material such as rubber; and to the corresponding face of the upper blade 82 is attached a punch or die member 172. When the blades 81, 82 move toward each other to detach a container, the members 171, 172 cooperate to form a hole or eye 169, Fig. 16, in the bottom seal E of a container next to be severed from the web.

The coacting faces of the knives 81, 82, Figs. 17 and 18, are preferably complementarily serrated so that the closed ends of the containers are not straight but correspondingly serrated Fig. 16; preferably one or the other of the blades for example blade 82, may have a tooth 173, Fig. 18, somewhat longer than the others, to be received by a correspondingly deeper notch in the other blade 81, to form, as appears in Fig. 19, a notch N which preferably extends to slight extent into the seal E. The container may be opened by pulling the edge on opposite sides of the notch N, the notch with certainty insuring tearing of the seal at the corner of the container for pouring out of its contents.

In many cases, the containers are made from web material printed or otherwise marked with recurrent decorations or printing generically termed "designs" and exemplified by the star D in Fig. 7; for various reasons, including the effects of ambient atmosphere upon the web material, irregularities in printing, or for other reasons, the lengths of webbing pulled by the

5/59

Plaintiff's Exhibit 5

6

successive reciprocations of the plunger 55 may not exactly correspond with the spacings between the recurrent designs, with the result there is cumulative error which, at least ultimately causes marked dissimilarity in appearance of the designs on the packages. This is prevented by a reverse feed mechanism RF operative upon the web material while it is free of engagement by the grippers of the package-forming mechanism F and while free of engagement by the longitudinal seal-forming device P.

Referring to Figs. 2 and 6, the web W passes between the gripper elements 174, 175; the former is affixed to the arm 176 pivotally mounted at 177 to the frame member 80 of the machine, and the latter is carried by the member 178 pivotally mounted upon the arm 176 and connected by link 179 to the armature 180 of a solenoid 181 mounted upon the arm 176. The spring 182 biases the gripper member 175 away from engagement with the web.

The oscillations of the member 176 of the registering mechanism are effected by cam 183 on shaft 118; the cam follower or roller 184 which continuously engages the periphery of cam 183 is carried by link 185 pivotally connected at 186 to the rocker arm 176 and having intermediate its end a slot 187 through which shaft 118 passes. For each rotation of shaft 118, the arm 176 moves toward and from the position shown in Fig. 6 to which it is biased by spring 182. At the beginning of the downward stroke of the arm 176, the solenoid 181 is energized, as hereinafter explained, to move the gripper member 175 to clamp the web against the cooperating gripper member 174 so that by the continued downward movement of member 176 the web W is pulled or fed in a reverse direction until a control element 188 on the web, which may be an opaque spot, interrupts the path of light from the lamp 189 to the photo-electric cell 190 or equivalent light-sensitive device. The interruption of the light causes deenergization of the solenoid, whereupon the spring 182 is effective to move the gripper element 175 away from the web for the remainder of the downward or counterclockwise movement of the arm 176.

Energization of the solenoid while the web is being advanced by the package-forming mechanism F or while its margins are being joined by the sealing device P, is prevented by the switch 191 whose operating lever 192 is controlled by cam 193 on the main shaft 33, Fig. 1. As appears in Fig. 20, the contacts of switch 191 are in series with the solenoid 181 to prevent energization of the solenoid so long as switch 191 is open, regardless of interruption of the path of light from lamp 189 to the photo-cell 190. The amplifier 195 in whose input and output circuits are respectively included the photo-cell 190 and solenoid 181 may be of conventional type employing one or more thermionic amplifier tubes.

With this arrangement, aforesaid accumulation of error is prevented; in each cycle of the machine, the webbing is re-registered at an aligning station exemplified by the photo-cell 190 and lamp 189. Although such alignment may or does not precisely determine the position of the decorative matter or design upon the package formed in that or any subsequent cycle of the machine, nevertheless it does prevent accumulation of error which would cause marked dissimilarities in appearance of the packages.

Because of the hereinbefore described elimination of stretching of the web material during its forward feeding movements, the registrations of the web, afforded by mechanism RF when the web is free of tension, i. e., free of engagement by either or both of the longitudinal and transverse seal-forming means, are effective, regardless of whether the web is Pliofilm, Cellophane, or any other thermoplastic material, to obtain the desired position of the designs on the filled or completed containers.

What we claim is:

1. In the art of making containers of web material, the method which comprises applying tension to the web material to draw it over a form to produce a tube, relieving the tension upon the web material, and while said material is relieved of tension joining its margins to each other to form a seal extending longitudinally of said tube.

2. In the art of making containers of thermoplastic web material, the method which comprises applying tension to the web material to draw it over a form to produce a tube, relieving the tension upon the web material, and applying heat and pressure to the margins of said web material while it is relieved of tension to avoid distortion of the seal formed by joinder of said margins.

3. In the art of making containers of web material, the method which comprises intermittently applying tension to the web material to draw it over a form to produce successive tubular elements, and joining the margins of each such element in an interval between applications of tension to said web material.

4. In the art of making containers of web material, the method which comprises applying tension to the web material to draw it over a form to produce a tube, during drawing of the web material relieving it locally of tension, and transversely sealing the tube so formed in a region relieved of tension.

5. In the art of making containers of thermoplastic web material, the method which comprises applying tension to the web material to draw it over a form to produce a tube, relieving said web material locally of tension, and transversely sealing the tube by application of heat and pressure to flatten it in a region relieved of tension.

6. In the art of making containers from thermoplastic web material, the method which comprises intermittently pulling the web material over a form to shape it into a tube with the web margins overlapping, and between successive pulls upon the web material applying heat and pressure to join said margins.

7. In the art of making containers from thermoplastic web material, the method which comprises pulling the web material over a form to shape it into a tube, and concurrently with pulling of the web material applying heat and pressure to form a seal transversely of a previously formed section of the tube which is free of tension.

8. In the art of making containers from thermoplastic web material, the method which comprises intermittently pulling the web material over a form to shape it into a tube with the longitudinal web margins in overlapping relation, between successive pulls upon the web material applying heat and pressure to said margins to seal the tube, and concurrently with aforesaid pulling of the web material applying heat and pressure to form a seal transversely of a pre-

5/60

...iously formed section of the tube which is free of tension.

9. In the art of making, filling and sealing containers of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material concurrently to form two transverse seals joined by an unsealed section, and severing the tube through the unsealed section to leave sealed margins along those edges of said seals which define the extremities of the containers.

10. In the art of making and sealing containers of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material to form a seal closing an end of an unfilled container, severing the web material to detach a previously filled container, and concurrently forming an eye in said seal.

11. In the art of making and sealing containers of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material both to form seals closing adjacent ends of successively formed containers and concurrently to mark one of said seals, severing the web material between the containers, and concurrently forming an eye in the other of said seals.

12. In the art of making, filling and sealing containers of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material to form a seal closing a filled container and to form a second seal closing an end of the tube, and severing the tube through the unsealed section of the tube between the seals to detach the filled container.

13. In the art of making, filling and sealing containers of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material to form a seal closing a filled container and to form a second seal closing an end of the tube, severing the tube between the seals to detach the filled container and to provide an unsealed margin for said first-named seal, and concurrently notching said margin of the web material beyond said first-named seal.

14. Mechanism for joining the margins of thermoplastic web material comprising means for effecting overlap of said margins to form tubing, heated structure, mechanism effecting intermittent engagement of said structure with the overlapping margins to effect their thermoplastic attachment to each other and so form a seam longitudinally of said tubing, and mechanism for advancing the web material after an engagement thereof by said heated structure, longitudinally of said tubing to extent less than the length of the margin thermoplastically joined during said engagement.

15. Mechanism comprising means for advancing, step by step, a web having its margins overlapping to form tubing, structure for pressing said margins into attachment with each other having an extent, in the direction of advance of the web, greater than the length of web fed per step, and mechanism for moving said structure into and out of engagement with the overlapping margins between successive forward movements of the web.

16. Mechanism comprising means for intermittently feeding thermoplastic web material having its margins overlapping to form tubing, heated structure for effecting attachment of said ... to each other, and means for effecting ... of said heated structure to engage the ... while at rest progressively to form ... seal longitudinally of said tubing ... forming said structure out of engagement with said web material during feeding ... and distortion of the seal.

17. Mechanism for making tubing from thermoplastic web material comprising a forming member for shaping the web material into a tube ... overlapping, heated structure intermittently movable toward said member ... attachment of said margins to each other incrementally to form a continuous seal ... tube, and mechanism for intermittently feeding the web material along said tube-forming member while disengaged from said structure to ... portion of the seal.

18. Mechanism for making tubing from thermoplastic web material comprising, a forming member about which the web material is shaped into a tube whose margins overlap, heated structure intermittently movable toward said member to press said margins into engagement with each other and concurrently to soften them, means effective between pressing movements of said structure to pull the tubing beyond said member and to pull further web material into position for engagement of its margins by said structure.

19. Mechanism comprising means for intermittently feeding thermoplastic web material having with its margins overlapping, pivotally mounted heated structure for pressing said margins into engagement with each other and concurrently softening them, and means for swinging said structure into and out of engagement with said margins between feeding movements of the web material positioning successive lengths of the margins thereof for engagement by said heated structure.

20. A machine for operating upon thermoplastic web material comprising feeding means effective during a part of each cycle of said machine to feed the web material with its margins overlapping, heated structure effective during another part of the cycle of said machine to press the margins into engagement with each other and concurrently soften them, and means adjustable to predetermine in said cycle the duration of engagement of said structure with said margins.

21. A machine for operating upon thermoplastic web material comprising feeding means effective during a part of each cycle of said machine to feed the web material with its margins overlapping, heated structure effective during another part of the cycle of said machine to press the margins into engagement with each other and concurrently soften them, control means for maintaining a predetermined temperature of said heated structure, and means adjustable to predetermine the duration of engagement of said heated structure with said margins.

22. A machine for operating upon thermoplastic web material comprising feeding means effective during a part of each cycle of said machine to feed the web material with its margins overlapping, heated structure effective during another part of the cycle of said machine to press the margins into engagement with each other and concurrently soften them, and means adjustable to predetermine the pressure applied to said margins by said heated structure.

23. A machine for operating upon thermoplas-

5/61

tic web material comprising feeding means effective during a part of each cycle of said machine to feed the web material with its margins overlapping, heated structure effective during another part of the cycle of said machine to press the margins into engagement with each other and concurrently soften them, and means adjustable to predetermine the temperature of said heated structure and the pressure applied thereby to said margins.

24. A machine for operating upon thermoplastic web material comprising feeding means effective during a part of each cycle of said machine to feed the web material with its margins overlapping, heated structure effective during another part of the cycle of said machine to press the margins into engagement with each other and concurrently soften them, and means adjustable to predetermine the temperature of said heated structure, the pressure applied thereby to said margins, and the duration of application of said pressure.

25. Mechanism for joining the margins of web material comprising means for effecting overlap of said margins, structure movable toward and from said web material, a member for pressing said margins into attachment with each other resiliently mounted upon said structure, and means for operating said structure adjustable to shift the limits of its movement and so vary the pressure applied by said member to the web margins.

26. Mechanism for making tubing from thermoplastic web material comprising a forming member for shaping the web material into a tube with its margins overlapping, and means for applying heat and pressure to said margins to effect their attachment to each other comprising a movably mounted housing, a margin-pressing tool supported by and extending from said housing, a thermostat within said housing for controlling the temperature of said tool, and mechanism for moving said housing toward and away from said forming member.

27. Mechanism for joining the margins of thermoplastic web material comprising means for effecting overlap of the margins, heated structure, reciprocating means, including a disengageable mechanical connection for intermittently moving said heated structure into engagement with the margins, and biasing means for moving said structure away from the web material during alternate strokes of said reciprocating means and upon breaking of said connection.

28. Mechanism for making tubing from thermoplastic web material comprising a rigid forming member having an insert of elastic material substantially unaffected by heat, means for shaping the web material about said member with its margins overlying said insert and overlapping each other, and heated structure for intermittently pressing the overlapping margins against said insert and concurrently softening them.

29. Mechanism for making tubing from thermoplastic web material comprising a rigid forming member having an insert of "Neoprene", means for shaping the material about said member with its margins overlying said insert and overlapping each other, and heated structure for pressing the overlapping margins against said insert and concurrently softening them.

30. Mechanism for making, filling and sealing containers of thermoplastic web material comprising a hollow forming member through which the containers are filled and about which the web material is shaped with its margins overlapping to form a tube, means for transversely flattening and sealing the tube at intervals to form containers comprising reciprocating structure which intermittently draws further web about said forming member, and means for pressing and heating said margins to seal the tube longitudinally thereof comprising heated structure movable toward and away from said forming member between successive web-drawing movements of said reciprocating structure.

31. Mechanism for sealing thermoplastic web material comprising members for applying heat and pressure to the web material to form a seal, and means for relieving the seal during its formation from tension comprising structure engaging the web material at a distance from the seal.

32. Mechanism for feeding and sealing thermoplastic web material comprising movable structure, means for applying heat and pressure to the web material to form a seal including relatively movable web-engaging members carried by said movable structure, and web-feeding members carried by said movable structure and spaced from said first-named members to relieve the heated web material of the seal from feeding tension.

33. Mechanism for feeding and sealing thermoplastic web material comprising reciprocating structure, means for applying heat and pressure to the web material to form a seal including relatively movable members carried by said movable structure for clamping the web material during the web-feeding stroke of said structure, and relatively movable members carried by said structure for clamping the web material at a distance from the seal during the web-feeding stroke of said structure.

34. Mechanism for sealing filled containers, formed from a tube of thermoplastic web material, comprising relatively movable members for flattening the tube and applying heat and pressure to the web material to form a seal closing a filled container, and relatively movable members for sustaining the weight of a filled container during formation of its seal by said first-named members.

35. Mechanism for making, filling and sealing containers of thermoplastic web material comprising a hollow forming element through which the containers are filled and about which the web material is shaped to form a tube, structure movable toward and away from said element, relatively movable members carried by said structure for flattening the tube and applying heat and pressure to form a transverse seal closing a filled container, web-feeding members carried by said structure for clamping the tube of web material between said forming member and said first-named movable members, and mechanism effecting engagement of the tube of web material by said first and second-named members for removing said structure from said tube-forming element.

36. Mechanism for making, filling and sealing containers of thermoplastic web material comprising a hollow forming element through which the containers are filled and about which the web material is shaped to form a tube, structure movable toward and away from said element, relatively movable members carried by said structure for flattening the tube and applying heat and pressure to form a transverse seal closing a filled container, relatively movable members for clamping the tube at a region between the seal and the filling in the container to relieve the

heated web material of the seal from the weight of the filled container, and mechanism effecting engagement of the tube of web material by said first and second-named members for movement of said structure from said tube-forming element.

37. Mechanism for transversely sealing and feeding a tube of thermoplastic web material comprising reciprocating structure, relatively movable sealing members carried by said structure for clamping the tube and softening the web material to form a seal, mechanism effecting clamping of the tube by said members for the feeding stroke of said structure, and means for relieving the heated seal from feeding stresses.

38. Mechanism for transversely sealing and feeding a tube of thermoplastic web material comprising reciprocating structure, relatively movable sealing members carried by said structure for clamping the tube and softening the web material to form a seal, mechanism effecting clamping of the tube by said members for the feeding stroke of said structure, and means for clamping the tube on opposite sides of the seal during its formation to relieve it from stress.

39. In a machine of the character described, a gripper having relatively movable jaws at least one of which is provided with a heated element coactive with the other jaw to apply heat and pressure to thermoplastic web material between them, and auxiliary elements respectively movable with said jaws and coactive with each other to relieve the heated web material while engaged by said heat-sealing elements from stresses imposed on the web material.

40. In a machine of the character described, a gripper whose relatively movable jaws comprise a pair of heat-sealing elements for applying heat and pressure to thermoplastic web material between them, and a pair of pivotally mounted elements for clamping the web material at a distance from said heat-sealing elements and for producing slack in the web material between said pairs of elements.

41. In a machine of the character described, a gripper whose relatively movable jaws comprise a pair of heat-sealing elements for applying heat and pressure to thermoplastic web material between them, and two pairs of resiliently mounted elements for clamping the web material on opposite sides of said heat-sealing elements and for providing slack in the web material between said heat-sealing elements and said resiliently mounted elements.

42. In a machine for making, filling and sealing containers of thermoplastic web material, members for transversely flattening and heat-sealing a tube of said material to form two seals connected by an unsealed section, and means for severing the tube through said unsealed section to detach a filled, sealed container.

43. In a machine for making, filling and sealing containers of thermoplastic web material, members for transversely flattening and heat-sealing a tube of said material to form two seals connected by an unsealed section, and means for severing the tube through said unsealed section to detach a filled, sealed container and means for notching the unsealed material at the end of the container to facilitate subsequent tearing of the seal for removal of the filling.

44. In a machine for sealing containers of thermoplastic web material, members for transversely flattening and heat-sealing a tube of said material to form a seal closing an end of a container, an element of yielding material carried by one of said sealing members, and a die element of rigid material carried by the other of said sealing members and coacting with said yielding element during the formation of a seal by said members to mark the seal.

45. In a machine for sealing containers of thermoplastic web material, a gripper comprising heated members movable to apply pressure and heat to form a seal closing an end of a container, and guard elements attached to said members for preventing contact therewith of the body of the container.

46. In a machine for sealing containers of thermoplastic web material, a gripper comprising heated members movable to apply pressure and heat to form a seal closing an end of an unfilled container, and guard elements attached to said heated members to hold the body of the container during filling from contact with said heated members.

47. In a machine for making, filling and sealing containers of thermoplastic web material, members for transversely flattening and heat-sealing a tube of said material to form two transverse seals connected by an unsealed section, elements associated with said members and coacting with each other during the formation of said seals to mark one of said seals, and means for severing the tube through said unsealed section and forming a hole through the other of said seals.

48. Shearing members relatively movable to cut across and divide a seal of web material joining containers formed of said material, and coacting elements carried by said shearing members respectively for forming a hole through the seal concurrently with division thereof by said members.

49. Shearing members relatively movable to cut across and divide a seal of web material joining containers formed of said material, an element of yielding material carried by one of said shearing members, and a die element carried by the other of said shearing members and coacting with said element of yielding material during division of the seal by said shearing members to punch a hole through one of the seal divisions.

50. Mechanism for joining overlapping margins of thermoplastic web material having recurrent designs thereon comprising heated structure, mechanism effecting intermittent movement of said structure to press said margins into engagement with each other and concurrently to soften them, means intermittently feeding web material with overlapping margins in the path of said heated structure, and means for preventing cumulation of variations in spacing of said designs including means for engaging and moving the web material while free of said heated structure and said feeding means.

51. Mechanism for joining overlapping margins of thermoplastic web material having recurrent designs thereon comprising heated structure, mechanism effecting intermittent movement of said structure to press said margins into engagement with each other and concurrently to soften them, intermittent means operative between successive engagements of the web margins by said heated structure to feed into the path thereof further web material with overlapping margins, and means for preventing cumulation of variations in spacing of said designs including means for engaging and moving the web ma-

5/63

terial while free of said heated structure and said feeding means.

53. A machine for making, filling and sealing containers from web material having recurrent designs thereon comprising a member about which the web material is shaped to form a tube, structure movable toward and from said member, heat-sealing elements carried by said structure and engaging the tube to form a seal transversely thereof during feed of the web by said structure from said member, and means for insuring substantially similar locations of said designs between the transverse seals comprising means for relieving the web material at and adjacent the transverse seals from feeding tension during their formation, and means effective between web-feeding movements by said structure to move the web material to extent to position a design at a predetermined location.

54. In the art of making containers from a web consisting of thermoplastic material, the method which comprises applying tension to the web to draw it over a form to produce a tube, applying heat and pressure to join the edges of said web and so form a seal extending longitudinally of said tube, and reducing the tension upon the web during aforesaid application of heat.

55. In the art of making containers from a web of a rubber derivative, the method which comprises applying tension to the web to draw it over a form to produce a tube, relieving the tension upon the web, and while the tension thereon is reduced applying heat and pressure to the web to join its edges and so form a seal extending longitudinally of said tube.

56. In the art of making containers from a web consisting of thermoplastic material, the method which comprises applying tension to the web to draw it over a form to produce a tube, locally reducing the tension applied to the web, and transversely sealing the tube in a region relieved of tension.

56. In the art of making containers from a web consisting of thermoplastic material, the method which comprises intermittently applying tension to the web to pull it over a form incrementally to shape it into a tube, and applying heat and pressure to the margins of the web only while the tension is reduced to form an undistorted seal extending longitudinally of the tube.

57. In the art of making containers from a web consisting of thermoplastic material, the method which comprises intermittently applying tension to the web to pull it over a form incrementally to shape it into a tube, applying heat and pressure to the margins of the web only while the tension is reduced to form an undistorted seal extending longitudinally of the tube, during movement of the web applying heat and pressure transversely of the tube beyond said form to produce a seal transversely of said tube, and reducing the tension on the tube at and adjacent the transverse seal.

58. In the art of making containers from a web consisting of thermoplastic web material, the method which comprises applying heat and pressure transversely of a tube of said material to form a seal closing one end of one container and to form a second seal spaced from the first and closing the opposite end of another container, and shortly thereafter severing the tube across the unsealed section between said seals.

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5/64

Plaintiff's Exhibit 5

Sept. 30, 1941. J. S. STOKES 2,257,433

METHOD OF AND APPARATUS FOR MANUFACTURE OF SEALED PACKAGES

Filed Nov 25, 1939

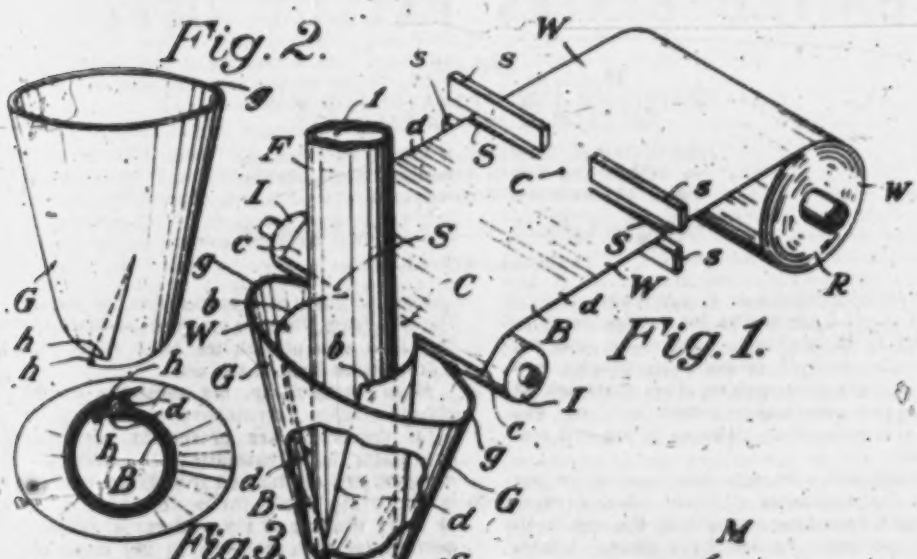
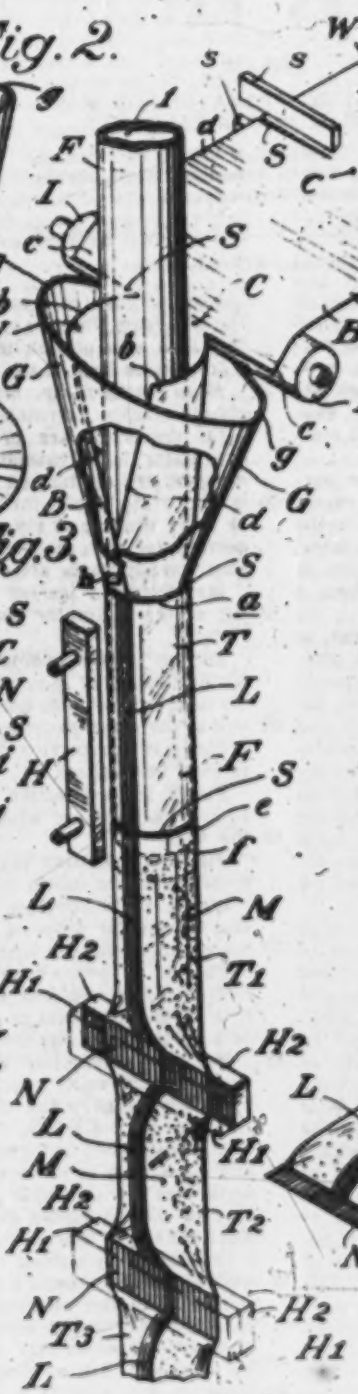


Fig. 2.

Fig. 1.

Fig. 3.

Fig. 5.



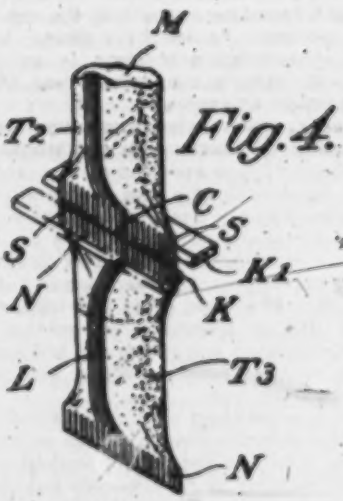


Fig. 4.

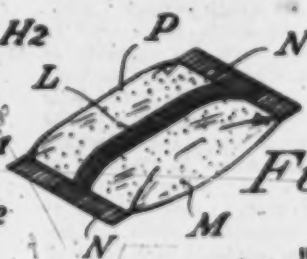


Fig. 6.

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5/76

Plaintiff's Exhibit 5

Patented Sept. 30, 1941 2,257,433

UNITED STATES PATENT OFFICE

2,257,433

METHOD OF AND APPARATUS FOR MANUFACTURE OF SEALED PACKAGES

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Application November 25, 1939, Serial No. 306,859

18 Claims. (Cl. 93—3)

My invention relates or is applicable to or in methods of and apparatus for producing closed or sealed filled packages, comprising and performing the step of forming receptacles, containers or bags from web or sheet material (for brevity herein generically termed "web" or "webbing"), and such other steps as filling and sealing them.

In accordance with my invention, more particularly for avoidance of those adverse effects upon appearance and strength of the web in the eventual packages caused by creasing, waving, crimping or wrinkling incident to pulling or feeding and forming the web to and about a former member, the web is transversely cut, slit or notched, at intervals longitudinally thereof to define sections or blanks each of a length preferably substantially or approximately corresponding with the length of a bag or container, inwardly from either or both edges of the web and to extent or extents limited to leave an unsevered portion constituting a connector element between neighboring blanks or sections and of cross section sufficient without rupture to transmit the necessary pull or feeding stress exerted upon the web throughout one or more of the succeeding steps, such as forming, filling and sealing the receptacles or bags.

Further in accordance with my invention, each transversely partially severed section or blank of the web is pulled or fed to and worked around the former member by progressively guiding and forming it into a tube; for which passage, formation and working of the blank there may be used any suitable means, such, for example, as the inner surface of a guiding and/or forming chute or tubular member, funnel-like in the sense the size of its bore or passage diminishes in the direction of pull or feed of the blank, effecting, preferably, overlap of its edges or margins, to constitute a tube of web material, which thereafter may be operated upon in any number of steps of any suitable characters, such for example as may effect attachment to each other of the aforesaid margins to constitute a longitudinal closure or seal, as may effect transverse sealing or closure of the tube to constitute precedent to filling a closed end, as may effect a second transverse closure or seal, and as may effect eventual severance of the so made and filled unit from the tube of web material.

Further in accordance with my invention, the eventual severance of a filled sealed unit from the tube of web material may be effected along a line substantially coincident with aforesaid transverse slits, cuts or notches, or by severing the unit from the tube on opposite sides of aforesaid slits, cuts or notches, so in effect removing a transverse strip of the seal.

More particularly, my methods having the characteristics hereinabove stated and hereinafter described, are preferably continuous in character, notwithstanding the web or sheet material or tube formed therefrom intermittently may come to rest for performance of any one or more steps; and my apparatus, utilizable for performing such methods, in like sense operates continuously, cycle after cycle.

My invention resides in methods and apparatus of the character hereinafter described and claimed.

For an understanding of my invention, and for illustration of some of the characteristics and forms of my methods and apparatus, reference is had to the accompanying drawing, in which:

Fig. 1, in perspective, illustrates aspects of my method and apparatus;

Fig. 2, in perspective, represents a chute or funnel-like member which may guide and form the web;

Fig. 3 is a bottom plan view of the exit end of the structure shown in Fig. 2;

Fig. 4, in perspective, illustrates the step of and means for severing a filled and closed or sealed unit from the tube of web material;

Fig. 5, in perspective, illustrates a modification of the step and apparatus for severance of a filled and closed or sealed unit by removal of a portion of a closure or seal;

Fig. 6, in perspective, illustrates a filled closed or sealed package, constituting the filled unit after severance by the steps or apparatus illustrated in Figs. 4 and 5.

As illustrative, but not limitative of methods and apparatus in or to which my methods and apparatus are utilizable or applicable, reference may be had to United States patents to Dwyer No. 1,986,422 or Aldrich No. 1,897,891.

Heretofore in pulling or feeding and working webbing to and around a former member to form a tube from the webbing, it has in advance of reaching the former member been passed over a yoke or shoulder-like structure or equivalent, for example such as designated 3, 3, or equivalent, in Fig. 4 of U. S. patent to Maxfield No. 2,160,367, or such as designated 21, 22, or equivalent, in Fig. 10 of aforesaid Dwyer Patent No. 1,986,422. So pulling the webbing over the shoulder or yoke structure or equivalent and flexing and working it to and around the former

5/71

time (such as 4 of aforesaid Maxfield patent or 24 of aforesaid Zwoyer patent) the webbing is subjected to such stresses as to cause it to become creased, wrinkled, crimped, folded, waved or otherwise affected, all for brevity comprehended by the term "creased," with resultant reduction in strength of the webbing continuing throughout the further steps performed thereon and into the stage of completion of a detached closed or sealed filled package, and with resultant disfigurement or detraction from the appearance of the walls of the eventual package.

Referring to Fig. 1, and associated figures, as illustrative of and generically exemplifying my improvements in method and apparatus for avoiding adverse effects including aforesaid reduction in strength or change in appearance of the webbing, there is provided a roll or supply R of webbing W, which may consist of one or more plies of such flexible or workable materials as may or may not be thermoplastic in character. For example, the web material may be paper, glazed paper, waxed paper, "Cellophane," moisture-proof "Cellophane," "Plioflim," "Diafane," "Protectoid" and the like, some of which are thermoplastic in character, well suited to sealing or attachment by application of heat and pressure, and some of which, not being thermoplastic in character, may be sealed or attached by recourse to contained or applied adhesive, wax, or the like. The term thermoplastic is here applicable to material which consists of or which is impregnated or coated with a thermoplastic; and when the web material comprises more than a single ply, it may as to one or more of the plies be thermoplastic in character, and as to the other ply or plies may in character be non-thermoplastic, but adhesive or capable of sealing or attachment by adhesive.

Webbing W is worked into the form of a tube T by passing it to and forming it about and along the former member F, which itself may be a tube through whose bore i the filling for the containers formed from the webbing is introduced into them. At any suitable region longitudinally of the tube T maybe applied to the web W a pull exerted thereon to withdraw it from the roll R and through such number of succeeding steps or stages as may be suitable or desirable.

In the example illustrated, the web W is fed to and formed about and along the former member F without recourse to, but in avoidance of the use and above described effects of, aforesaid yoke or shoulder structure, or equivalent.

In lieu of employment of such yoke or shoulder structure or any other equivalent structure or means having the aforesaid adverse effects upon the strength or appearance of the webbing, web W is transversely partially severed, by cutting, slitting or notching it inwardly from either or both of its longitudinal edges as indicated at the cuts, slits or notches S, S. In the example illustrated the web is cut or slit, as by cooperating shearing members *s*, *s*, preferably actuated during a pause in the pull upon or feed of the web W. In lieu of simply cutting or slitting the webbing W, there may be employed suitable structure for notching the webbing, effective to cut out of the web suitably narrow strips of tapering, rectangular or other shape, located, however, at the intervals and positions here described respecting the slits or cuts S, S. The term cut or slit shall be understood in addition to comprehend a notch.

Successive actuations of the shearing members *s*, *s*, or the notching members employed as aforesaid in lieu thereof, occur with such spacing longitudinally of the web or at such intervals of time as to define between successive slits or notches blanks or sections B, each of extent longitudinally of web W at least sufficient to insure desired length of the finished package, or preferably of a length substantially equal to or approximately corresponding with the length of each receptacle, container or bag subsequently formed from web W.

So incompletely transversely slitting or notching the web leaves connector portions or elements C, at like intervals lengthwise thereof, of sufficient cross-section to withstand, without rupture, the pull or feeding stress exerted upon the web W throughout its feed from roll R to or through any later stage, usually and preferably including the stage of final closure or sealing of each filled unit or the stage of severance thereof to effect an unattached filled and sealed package.

Each section or blank B passes over the idler roll I, suitably adjacent the former member F, while continuing substantially flat except for some incidental curvature in accord with the surface of the roll I. Broadly, the opposite lateral portions of blank B are directly, in the sense of avoidance of use and of the effects (for brevity generically termed creases or creasing) of aforesaid shoulder or yoke structure or equivalent, curled toward each other, to extent eventually to simulate or constitute a tube. More specifically viewed the leading corners *c*, *c* of blank B first are brought to embrace, or be curled or formed around, the member F, while progressively partaking during web feed of further curl or circular formation of concurrently progressively decreasing diameter, until the leading transverse edge of slit S and blank B reach approximately the position *a*, at which time its trailing transverse edge *b*, *b* forms an open or incomplete circumference while more or less spaced from the outer surface of the member F. Thereafter, in descending (along and in contact with the former F or equivalent, if employed) the trailing edge *b*, *b* progressively approaches the former F, and the gap between the longitudinal edges *d*, *d* of the blank progressively closes, preferably with overlap of the longitudinal marginal portions of the leading end of the blank B; such action proceeds until the trailing end of the blank reaches approximately the position *a* and its leading end reaches approximately the position *e*, corresponding approximately with the lower end *f* of former F, at which formation of the upper tube section or unit T is completed, preferably with its longitudinal margins overlapping or otherwise disposed in readiness for attachment to each other, and with its upper connector element C still integral with the blank B immediately above.

There are in succeeding intervals formed from web W further blanks or sections B, integrally and continuously united in train through aforesaid connector element C, at least throughout the stage of formation of uppermost tube section or unit T, and preferably throughout later steps or stages to that of final detachment of a filled and closed tube unit.

The following steps of longitudinally and transversely closing or sealing, filling and detaching filled tube units are exemplary only, without limitation of my invention to them or any of them, except as hereinafter may be claimed.

The margins of unit T are joined, to form the

5/72

longitudinal closure or seal L, preferably corrugated as shown, adhesively or by any equivalent method, such as heat sealing by any suitable heater, generically represented by the electrically or otherwise heated member H periodically pressed against aforesaid overlapping margins, backed by the former F.

The tube-clamping members H1, H2, a, least one of which is electrically or otherwise heated, and of which one may be corrugated to form a transverse corrugated seal N, in some cases effectively complete or integral at and across the slits S, S, those portions of seal N to either side of seal L. Seal N is of extent longitudinally of tube unit T1 sufficient to include the slits or notches S, S in the web material; it is also wide enough to provide the top seal of filled tube unit T2. Members H1, H2, having effected such transverse bottom seal of unit T1, the filling M is introduced into it, as through the bore of member F.

The complete or integral sealing aforesaid at and across the slits or notches S, S is not essential to my invention, though procurable in especially those instances when the web material is to suitable extent thermoplastic. In any event, however, whether or not the web material be thermoplastic, the attachment or sealing of parts of the web material to each other is perfect and continuous throughout each connector element C and throughout those portions of the seals N above and below the slots or notches S, S if they remain open; and whether or not they remain open, final severance of a filled and sealed tube unit, such as T3, is preferably so effected, as in Figs. 4 and 5, that said slits or notches are not within the wall or seal structure of, and do not appear in, the finished package P.

For brevity herein the term "seal" comprehends in addition to the definitely described seals L and N, all those types of closures and web-attaching means equivalent to seals L and N for the purposes of and within the spirit of my invention.

The sealing members H1, H2, while tightly clamping the tube, are periodically moved from their upper or full-line position, to the lower position indicated in dotted lines, so pulling downwardly, to the extent of the length of a blank B, the upper tube unit and blanks B, B, and web W from roll R; after which the members H1 and H2 separate and return to their aforesaid upper position.

The tube unit T3, Figs. 1 and 4, next below unit T2 of Fig. 1 and previously bottom sealed, filled and top sealed, is in readiness for complete severance through the seal N and the therein comprehended slits or notches S, S and connector unit C. Such complete and final severance is effected by the cooperating knife or shearing members K, K1 actuated, as well understood in the art, in suitably timed relation to the operations of the sealing members H, H1 and H2, in timed relation with which operations my aforesaid cutter or notching members s, s are actuated. The line of severance effected by aforesaid members K, K1 may and preferably is substantially coincident with the aligned slits or notches S, S.

The so finally and completely severed filled tube unit T3 becomes then an unattached closed or sealed and filled package P, Fig. 6. Such packages are completed by performance of steps of the character above described or of equivalent steps in rapid succession, constituting a continuous method, notwithstanding intermittance in movement of the web W, blanks B and tube units T etc.

In Fig. 5, as in Fig. 4, there is shown the lower portion of the tube unit T2 of Fig. 1, which has been bottom sealed, filled and top sealed. And below it is the previously produced filled and sealed unit T3 just after severance, from unit T2, at *i* and *j*, into a final package P, Fig. 6. The effect of severance at both *i* and *j* is to cut out from the transverse seal N a section N1 within which are included a connector element C and its adjacent slots or notches S, S. The upper portion of seal N constitutes the bottom seal of unit T3, and the lowermost portion of seal N constitutes the top seal of unit T3. Severance, as aforesaid, at *i* and *j*, is effected by the pairs of shearing elements O, O1 and O2, O3, actuated in timed relation, as in the case of knife elements K, K1 of Fig. 4, to the precedent operations in the method or of the apparatus.

The formation of a blank or section B in its first stage of relation to the former F, may be controlled or accomplished by recourse to any suitable means, exemplified by the tubular or funnel-like member G, surrounding the former F, and at its upper end *g* sufficiently widely spaced therefrom to accommodate entry of the leading edge and corners *c*, *c* of the blank B as it leaves the roll I. As blank B within the member G is pulled downwardly, it is guided or formed by the inner surface of member G to effect a generally or approximately conical formation of the blank whose lower end, at approximately the position *a*, is closed, and as its such leading end descends, its upper portions are progressively contracted to the form and dimensions of the lower end of member G, which serves as a forming aperture, with the longitudinal margins of the blank B overlapping, so constituting the tube unit T.

As indicated in Figs. 2 and 3, at its lower end and for some distance above it, the wall of the member G is slit, and its edges *h*, *h*, as indicated in Fig. 3, overlap and are spaced from each other to form a gap, whereby said margins of blank B are caused to overlap as aforesaid as they progressively pass from within member G through the lower or exit end thereof, so forming tube unit T with its margins overlapping.

Besides being unitary, of width sufficient alone to form a tube T, each blank may be composite, comprised of a plurality of narrower components, each slit or notched transversely inwardly from each or both of its edges as hereinbefore described, the total of the widths of the several components then being sufficient to form the tube; the webbing for such components may be stored on and withdrawn from two rolls as generically indicated in Fig. 10 of Maxfield U. S. Patent 2,146,831. The two components are then slit or notched, and then simultaneously passed to and individually directly, in avoidance of crossing either blank component, curled about the former F, each component forming a half tube, whose longitudinal edges or margins are then attached or sealed to those of the companion half tube, as described in connection with a unitary blank, to constitute a tube unit T. For brevity, in the claims the term "blank" comprehends both unitary and composite blanks.

Such forces and workings as are, by practice of my invention, imposed on the unitary or composite blank of web material in forming it into a tube or equivalent, do not at all, or at most

5/73

negligibly, affect its strength or appearance; and the slits or notches S, S, involved do not adversely affect the various marginal or transverse closures or seals, and preferably do not appear in the final product.

What I claim is:

1. A method of making, filling and sealing packages comprising transversely partially severing webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, in avoidance of creasing the blank directly curling it into tubular form, attaching longitudinal marginal portions of the tube to each other, transversely sealing the tube throughout an area within which lie severed and unsevered portions of the blank, introducing filling material into the tube through the open end thereof, transversely sealing said open end throughout an area in which lie severed and unsevered portions of the blank, and detaching the filled sealed tube at said last named area.

2. A method of making, filling and sealing packages comprising transversely partially severing webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, in avoidance of creasing the blank directly curling it into tubular form, attaching longitudinal marginal portions of the tube to each other, transversely sealing the tube throughout an area within which lie severed and unsevered portions of the blank, introducing filling material into the tube through the open end thereof, transversely sealing said open end throughout an area in which lie severed and unsevered portions of the blank, and detaching the filled sealed tube substantially at the severed and unsevered portions in said second named area.

3. A method of making, filling and sealing packages comprising transversely partially severing webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, in avoidance of creasing the blank directly curling it into tubular form, attaching longitudinal marginal portions of the tube to each other, transversely sealing the tube throughout an area within which lie severed and unsevered portions of the blank, introducing filling material into the tube through the open end of the tube, transversely sealing said open end throughout an area in which lie severed and unsevered portions of the blank, and detaching the filled sealed tube by removing from said second named area a section thereof within whose area are included severed and unsevered portions of the web material.

4. Apparatus for forming, filling and sealing packages comprising a former member, a supply of webbing, means for feeding the webbing from said supply with respect to said former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, means for directly curling the blank, in avoidance of creasing thereof, about said former member into tubular form, means for closing said tubular form along its longitudinal edges to constitute a tube unit, means for transversely sealing the tube unit adjacent one end thereof throughout an area including and unsevered portions of the blank, means for filling the tube unit, means for effecting a transverse seal of said tube unit adjacent its other end throughout an area including slit and unsevered portions of the blank, and means for detaching the sealed filled unit by severance through said seal.

5. Apparatus for forming, filling and sealing packages comprising a former member, a supply of webbing, means for feeding the webbing from said supply with respect to said former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, means for directly curling the blank, in avoidance of creasing thereof, about said former member into tubular form, means for closing said tubular form along its longitudinal edges to constitute a tube unit, means for transversely sealing the tube unit adjacent one end thereof throughout an area including slit and unsevered portions of the blank, means for filling the tube unit, means for effecting a transverse seal of said tube unit adjacent its other end throughout an area including slit and unsevered portions of the blank, and means for detaching the sealed filled unit by severance through said seal in substantial alignment with the slit and unsevered portions included therein.

6. Apparatus for forming, filling and sealing packages comprising a former member, a supply of webbing, means for feeding the webbing from said supply with respect to said former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, means for directly curling the blank, in avoidance of creasing thereof, about said former member into tubular form, means for closing said tubular form along its longitudinal edges to constitute a tube unit, means for transversely sealing the tube unit adjacent one end thereof throughout an area including slit and unsevered portions of the blank, means for filling the tube unit, means for effecting a transverse seal of said tube unit adjacent its other end throughout an area including slit and unsevered portions of the blank, and means for removing from said seal a portion thereof including slit and unsevered portions of the blank to effect detachment of a sealed filled unit.

7. Apparatus for forming webbing into tubular form comprising a former member, means for feeding the webbing in one direction toward said former member and in substantially different direction along the former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, and means for directly curling the blank, in avoidance of creasing thereof, about said former member into tubular form.

8. Apparatus for forming webbing into tubular form comprising a former member, means for feeding the webbing in one direction toward said former member and in substantially different direction along the former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, a funnel-like member surrounding said former member to receive the webbing adjacent the change in direction of its feed, and means for directly curling the blank, in avoidance of creasing thereof, within said funnel-like member and about said former member into tubular form.

9. Apparatus for forming webbing into tubular form comprising a former member, means for feeding the webbing in one direction toward said former member and in substantially different direction along the former member, means in advance of said former member for slitting the webbing transversely in partial severance thereof to form a blank, a funnel-like member surrounding

5/24

and spaced from said former member adjacent the change in direction of feed of the webbing and having at least adjacent its portion of smaller diameter a slit whose longitudinal edges overlap in spaced relation to each other, and means for directly curling the blank, in avoidance of creasing thereof, within said funnel-like member and about said former member with its margins overlying the spaced overlapped edges of said funnel-like member.

10. A method of making, filling and sealing containers which comprises slitting webbing at intervals longitudinally thereof partially transversely to sever it, shaping the webbing, so partially severed in avoidance of creasing during shaping, and joining longitudinal edges thereof to form a tube having slits at intervals longitudinally thereof, transversely sealing the tube to form containers whose interiors are isolated from each other and from the slits, filling each of said containers after closure of an end thereof by a transverse seal, and severing the webbing between the closed ends of adjacent containers in succession to detach filled sealed containers from the webbing.

11. A method of making, filling and sealing containers which comprises slitting webbing at intervals longitudinally thereof partially transversely to sever it, shaping the webbing, so partially severed in avoidance of creasing during shaping, and joining longitudinal edges thereof to form a tube having slits at intervals longitudinally thereof, transversely sealing the tube adjacent each of the slits to form and close adjacent ends of a container to be filled and a filled container, and severing the webbing between the closed ends of adjacent containers in succession to detach sealed filled containers from the webbing.

12. A method of making, filling and sealing containers which comprises shaping webbing about a hollow form and joining longitudinal edges thereof to form a tube, at intervals longitudinally thereof transversely partially severing the webbing in advance of the form in avoidance of creasing of the webbing during aforesaid shaping thereof, transversely sealing the tube at intervals longitudinally thereof to define a series of containers with the severed portions of the webbing located between adjacent containers and isolated therefrom by the transverse seals, introducing filling into the containers through said form, and transversely severing the webbing to detach filled sealed containers therefrom.

13. A method of working webbing into a tube which comprises feeding the webbing in one direction toward a form, shaping the webbing about the form during feed of the webbing in a substantially different direction along the form and in advance of said form transversely partially severing the webbing in avoidance of creasing thereof during aforesaid shaping.

14. A method of working webbing into tubular form comprising feeding the webbing toward a former member, in advance of the former member transversely partially severing the webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, imparting to the feed of the blank a direction at a substantial angle to said first-named direction of feed, and substantially nearer parallelism with the forming surface of said former member, in avoidance of creasing the blank incident to aforesaid change in direction of feed thereof directly curling the blank about said former member into form converging progressively from larger diameter thereof adjacent its integral attachment to smaller diameter thereof, and converting the so curled blank into tubular form.

15. A method of working webbing into tubular form comprising feeding the webbing toward a former member, in advance of the former member transversely partially severing the webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, imparting to the feed of the blank a direction at a substantial angle to said first-named direction of feed and substantially nearer parallelism with the forming surface of said former member, in avoidance of creasing the blank incident to aforesaid change in direction of feed thereof directly curling the blank about said former member into form converging progressively from larger diameter thereof adjacent its said integral attachment to smaller diameter thereof, and converting the so curled blank into tubular form with longitudinal margins of the blank overlapping.

16. A method of working webbing into tubular form comprising feeding the webbing toward a cone-like surface, in advance thereof transversely partially severing the webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, imparting to the feed of the blank a direction at a substantial angle to said first-named direction of feed and substantially nearer parallelism with said cone-like surface, in avoidance of creasing the blank incident to aforesaid change in direction of feed thereof converting it into tubular form by passage thereof in contact with said cone-like surface.

17. A method of working webbing into tubular form comprising feeding the webbing toward a forming aperture, in advance thereof transversely partially severing the webbing to define a blank remaining integrally attached to the webbing through the unsevered portion thereof, imparting to the feed of the blank for passage through said forming aperture a direction at a substantial angle to said first-named direction of feed, in avoidance of creasing the blank incident to aforesaid change in direction of feed thereof curling it with its margins overlapping at least at its leading end, and converting the portion of the blank trailing its said leading end into tubular form by drawing the curled blank through said forming aperture.

18. A method of detaching filled closed packages of web material from a tube thereof formed from blanks defined by transverse partial severance of the webbing and each joined to the preceding and subsequent blanks by unsevered portions of the webbing, comprising removing an area, including severed and unsevered portions of the webbing, between closed ends of neighboring packages formed from immediately succeeding blanks.

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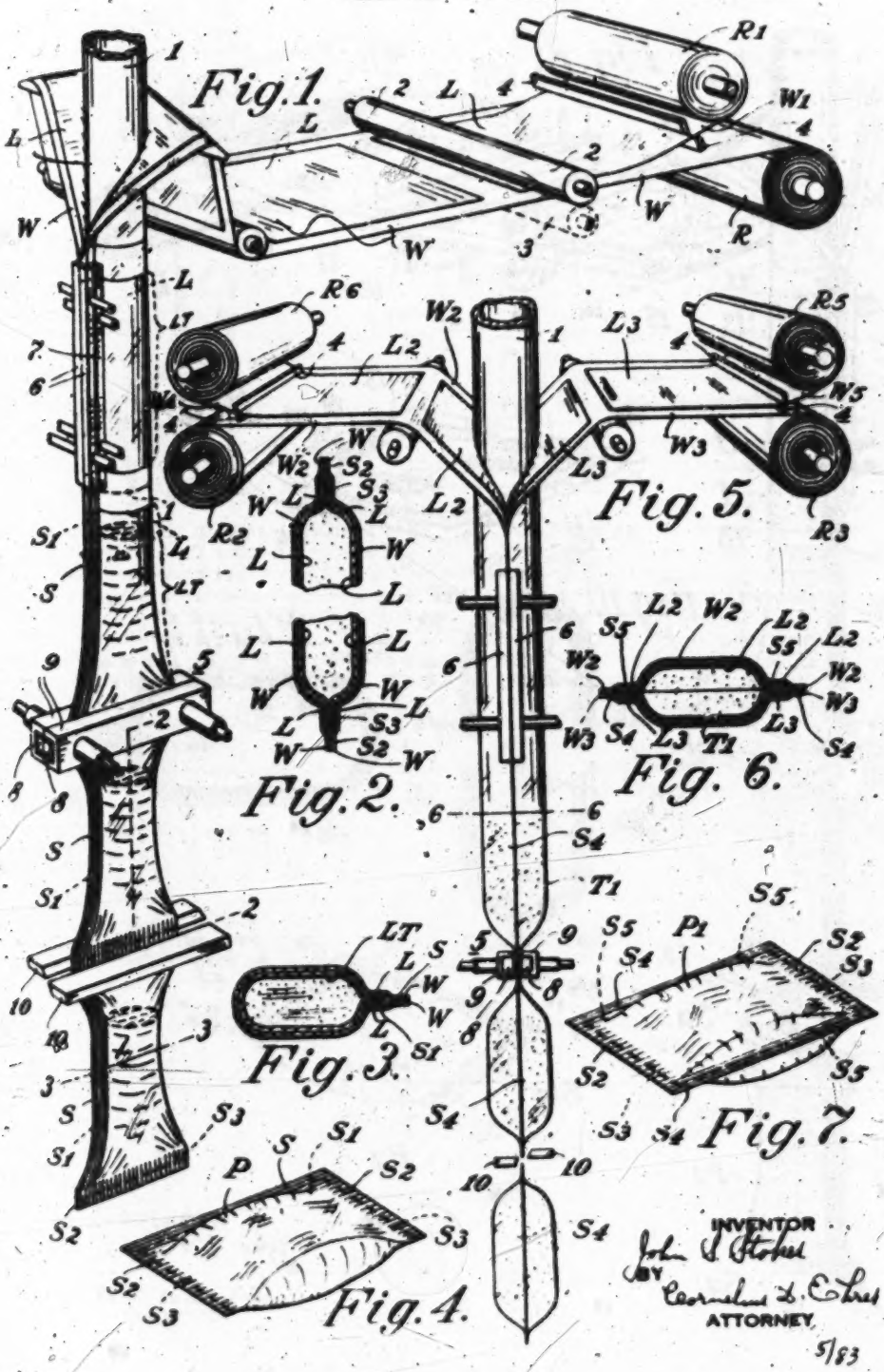
5/75

Plaintiff's Exhibit 5

Oct. 7, 1941. J. S STOKES 2,257,823

METHOD AND APPARATUS FOR PRODUCING CONTAINERS

Filed Jan. 15, 1940 4 Sheets-Sheet 1



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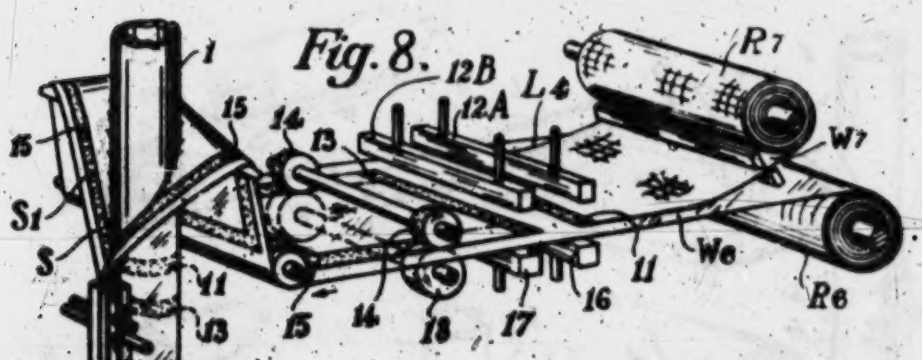
5/83

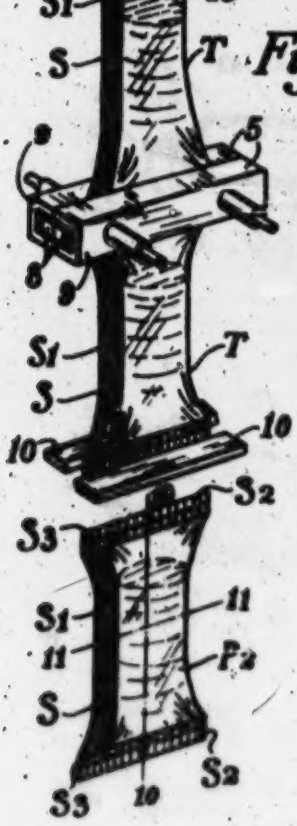
Plaintiff's Exhibit 5

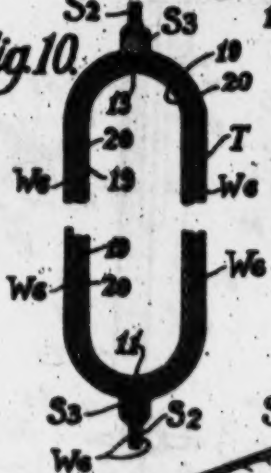
Oct. 7, 1941. J. S. STOKES 2,257,823

METHOD AND APPARATUS FOR PRODUCING CONTAINERS

Filed Jan. 15, 1940 4 Sheets-Sheet 2







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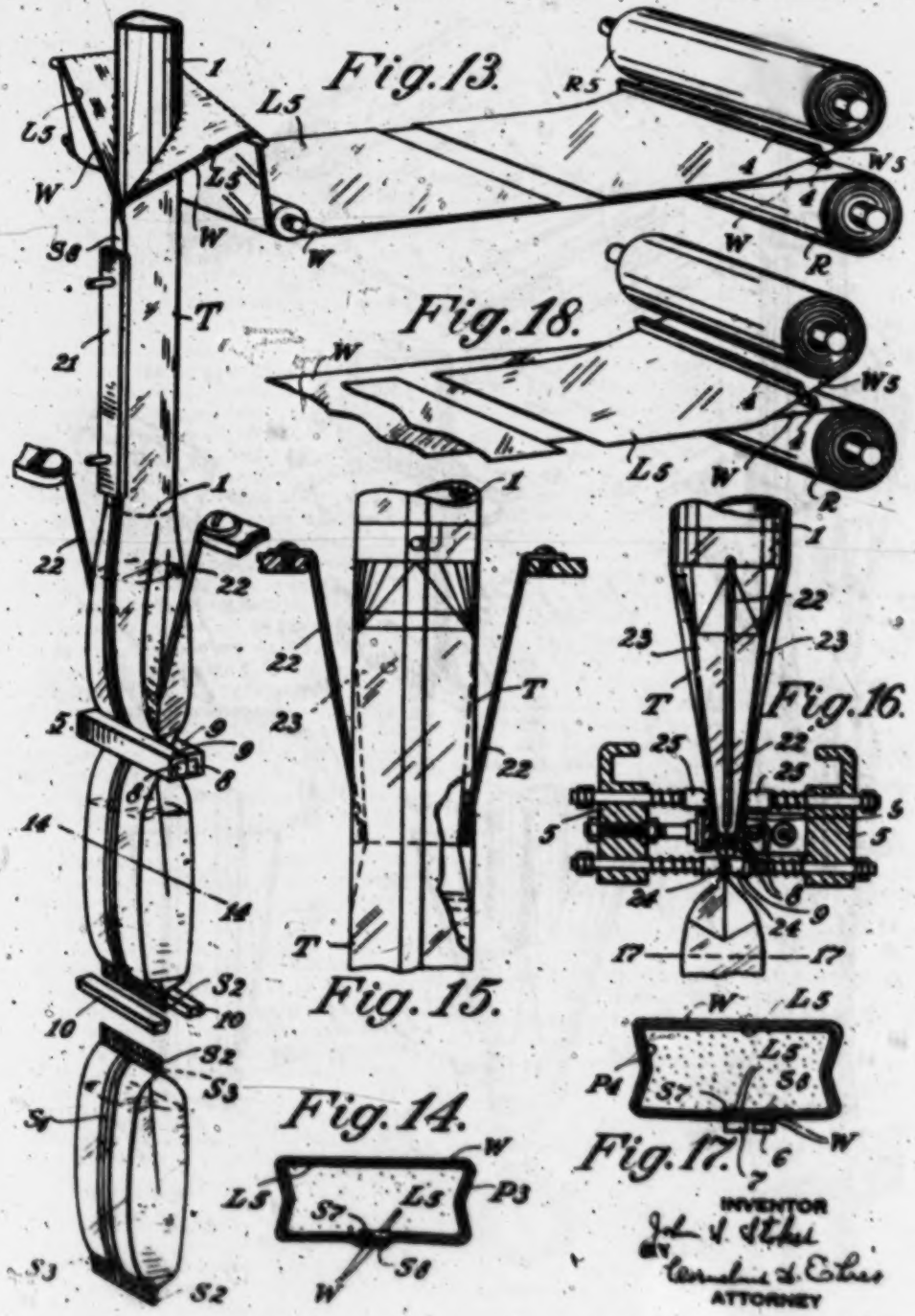
5/84

Plaintiff's Exhibit 5

Oct. 7, 1941. J. S. STOKES 2,257,823

METHOD AND APPARATUS FOR PRODUCING CONTAINERS

Filed Jan 15, 1940 4 Sheets-Sheet 2



5/15

Plaintiff's Exhibit 5

Oct. 7, 1941. J. S. STOKES 2,257,823

METHOD AND APPARATUS FOR PRODUCING CONTAINERS

Filed Jan. 15, 1940 4 Sheets-Sheet 4

Fig. 19.

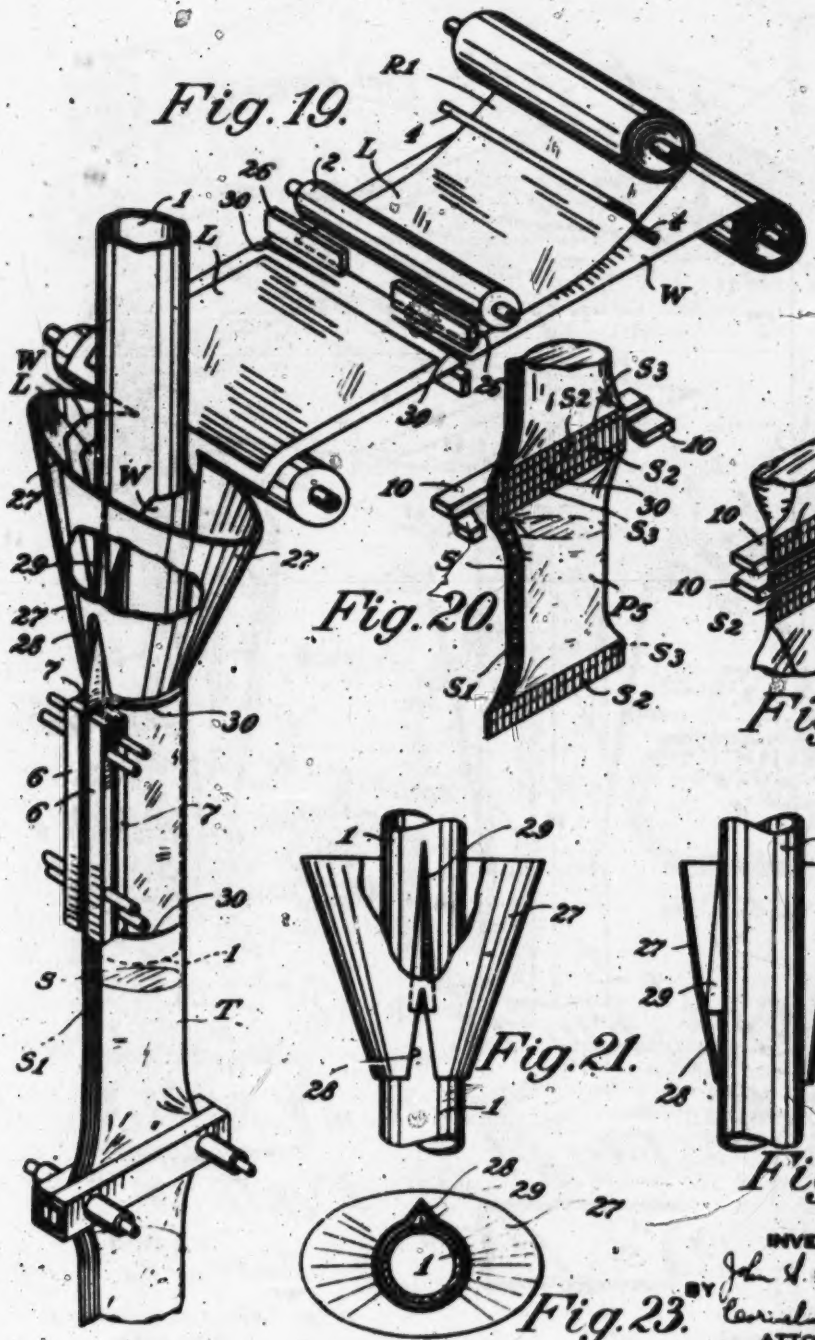


Fig. 20.

Fig. 24.

Fig. 21.

Fig. 22.

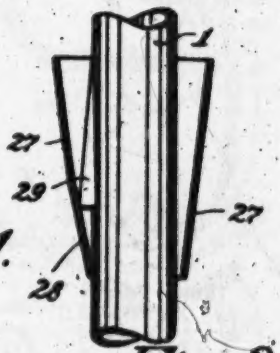


Fig. 23.

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5/82

Plaintiff's Exhibit 5

Patented Oct. 7, 1941

UNITED STATES PATENT OFFICE

2,257,823

METHOD AND APPARATUS FOR PRODUCING CONTAINERS

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Summerdale, Pa., a corporation of Pennsylvania

Application January 15, 1940, Serial No. 313,889

13 Claims. (Cl. 93—3)

My invention relates to the manufacture of packages or containers, particularly composite, or lined, or double wall packages or containers, made from flexible sheet material, such as Cellophane, Pliofilm, paper or the like.

In accordance with one aspect of my invention, one or more lining elements are so positioned upon, with or without attachment thereto, sheet or web material from which the outer container or covering is eventually formed, and are of such dimensions that all outer seals of the container or package are formed by direct attachment to each other of portions of the covering material and the inner seals are formed by direct attachment to each other of portions of the sheet lining material; consequently, when the adhesives applied to, or comprised in the selected covering and lining materials are of different characteristics, the inner and outer seals are formed respectively under those different conditions of time, pressure or temperature, best suited for effective sealing by the different adhesives.

In a preferred method, the lining elements are spaced along the webbing of one or more continuous webs destined to form the outer container and are shaped concurrently therewith to form spaced tubular sections within a continuous outer tube; to close an end of a lined container or package, the outer tube is flattened and is individually sealed between successive tubular lining sections, and the corresponding end of one of the lining sections is individually flattened and sealed; preferably the lined containers are filled prior to their detachment from the web by introduction of filling into the innermost container or lining and each is detached from the web by transversally severing the outer tube between successive lining sections.

More particularly, each of the lining elements as applied to an individual sheet, or to continuous webbing, is suitably shorter than the outer container to provide for the aforesaid direct attachment to each other of those portions of the outer container forming end seals; direct attachment to each other of those portions of the outer container forming its side seal or seals is provided either by using lining elements which are narrower than the outer sheet or web, by offsetting the lining elements with respect to the outer sheet or web, or by suitably guiding the edges of the lining elements as they are shaped into tubular form.

My invention further resides in the methods of and apparatus for making packages hereinafter described and claimed.

For an understanding of my invention, reference is to be had from the accompanying drawings, in which:

Fig. 1, in perspective, illustrates a method of and apparatus for making, filling and sealing lined containers.

Fig. 2 is an elevational view in section, taken on line 2—2 of Figure 1.

Fig. 3 is a plan view in section taken on line 3—3 of Figure 1.

Fig. 4, in perspective, shows a filled container produced by the method of Figure 1.

Fig. 5, in perspective, illustrates another method and apparatus for making, filling and sealing lined containers.

Fig. 6 is a plan view, in section, taken on line 6—6 of Figure 5.

Fig. 7, in perspective, shows a filled container produced by the method and apparatus of Figure 5.

Fig. 8 in perspective, illustrates another method and apparatus for making, filling, and sealing containers whose lining is not thermoplastic.

Fig. 9, in perspective, shows a multi-ply lining element.

Fig. 10 is an elevational view on a larger scale, taken on line 10—10 of Figure 8.

Fig. 11 is a plan view, in section, taken on line 11—11 of Figure 8.

Fig. 12, in perspective, illustrates a filled package produced by the method and apparatus of Figure 8.

Fig. 13, in perspective, illustrates a method and apparatus for making lined containers of the square type.

Fig. 14 is a plan view, in section, taken on line 14—14 of Figure 13.

Fig. 15 is an elevational view, on a larger scale, of tuck-forming mechanism shown in Figure 13.

Fig. 16 is an end elevational view of the apparatus shown in Figure 15 with addition of, in cross section, the end sealing tools.

Fig. 17 is a plan view, in section, taken on line 17—17.

Fig. 18, in perspective, illustrates the initial step of a modification of the method shown by Figure 13.

Fig. 19, in perspective, illustrates another method of and apparatus for making, filling and sealing lined containers.

Fig. 20 is a continuation of Figure 19 and il-

5/11

lustrates the final step of severance of a complete package from the webbing.

Fig. 21 is a front elevational view, with parts broken away, of web shaping structure shown in Figure 19.

Fig. 22 is a side elevational view, partly in section, of the structure shown in Figure 21.

Fig. 23 is a bottom plan view of Figure 21.

Fig. 24 illustrates a modified manner of detaching the containers.

Referring to Figure 1, the web W may be of "Pliofilm," Cellophane, paper or other sheet material coated with, impregnated with, or consisting of thermoplastic material. As it is fed from the roll R toward and about the hollow former member f, there is deposited upon it a series of lining elements L, each shorter than the length of webbing W to be utilized for making a single container, and in this particular modification, suitably narrower than the webbing W by an amount corresponding with about twice the width of an outer side seal S.

The lining elements L are also in this modification of thermoplastic sheet material, which may be the same as, but is usually and preferably different from, the sheet material of which web W is comprised.

The lining elements L may be fed from a stack thereof onto webbing W or, preferably, they may be cut from the continuous web W1 removed from roll R1.

To maintain the desired spacing between the lining elements and to preclude their displacement with respect to webbing W as it is fed toward the former f, there may be employed the heated roller 2 for softening the adhesive in or upon one or both of the webs W, W1 at least sufficiently to preclude accidental shift in position of the lining elements. A second roll 3, or equivalent pressure plate, provides the desired pressure upon the webs during the aforesaid application of heat by roll 2. The knives 4, 4, which cut the lining elements L from the web W1 operate in proper timed relation to feed of the web W to obtain the desired spacing between the adjacent ends of successive lining elements L which spacing as hereinafter appears corresponds with the width of two outer end seals S1.

Beyond the rolls 2, 3, the web W and applied lining elements L are shaped about the hollow former member f, the web W forming a continuous outer tube T, and the lining elements L forming a series of tubular sections LT spaced from each other within the continuous outer tube T.

The composite webbing is fed, in the particular arrangement shown, by a pair of reciprocating clamps 8, 8 which flatten the tube T between successive sections LT somewhat beyond the end of the former member f; while the clamps maintain their grip upon the tube they are moved away from former f to an extent corresponding with the desired length of a container. The clamps then release the tube, and while so free of it, return to their original position.

While the webbing is at rest between successive feeding strokes, the marginal edges of web W are thermoplastically joined by the sealing tools 9, 9, one or both of which may be heated and in any event subject the edges of webbing W to a temperature suited to the heat sealing characteristic of the material forming it; the pressure exerted by the tools 9, and the duration of their engagement with the edge of the web are also selected to suit the characteristic of the material comprising the web W so to obtain optimum sealing results.

Substantially concurrently with the formation of the outer longitudinal seal or seam S by tools 9, the longitudinal edges of one of the lining elements L is subjected to heat and pressure by a second set of sealing tools 7, 7 to form an inner seal S1.

The clamps 8 which effect feed of the webbing also comprise or carry two sets of sealing tools; tools 9, 9 heat and press into direct engagement with one another, opposite sides of the outer tube between successive lining sections LT whereas the other pair of sealing tools 9, 9 flatten and seal the adjacent ends of two successive lining sections LT.

The outer seal S2 is formed by tools 9, 9 under these conditions of temperature, pressure, and time suited to the thermoplastic applied to or comprised in web W, and the inner end seal S3 is formed by tools 9, 9 under these different conditions of temperature, time and pressure best suited to the thermoplastical material of which it is comprised or with which it is coated; when for example, the web W is of Cellophane and the lining elements are of Pliofilm, the tools 7, 7 are at elevated temperature lower than the temperature of tools 9, 9.

The completed containers are detached from the webbing by the knives 10, 10; when unfilled containers are desired, the knives 10, 10 are set to cut between the double width seal S2 and one of the seals S3. Preferably, however, the containers are filled prior to their severance from the web, as by introduction of filling material through the hollow former member f between the two end sealing operations performed upon a single container. To detach the filled containers or packages from the web, the knives 10, 10 are set to cut through the seals S2, approximately midway thereof. The individual completed package is shown in Fig. 4.

As more clearly appears from Figs. 2 and 3, the filling is within the inner container or lining sealed at both ends by seals S3, with the outer end seals S2 outside of or beyond the inner seals S3; similarly as appears in Fig. 3, the side seal S1 of the inner container or lining is entirely within the covering or outer container formed from webbing W, with the outer seal S outside or beyond it.

Thus, all of the outer seals of the package P, Fig. 4, are formed by direct attachment to each other of portions of the outer covering shaped from the web W, whereas all of the inner seals S3 are formed by direct attachment to each other of portions of the lining material. Whether or not there is any adhesion between the outer faces of the inner seals and the inner face of the outer covering is immaterial; and in most cases when both webs are thermoplastic, there will be at least some incidental adhesion at these areas which are not effective as seals, even though the adhesion is firm, because of their location.

Because the inner and outer seals are formed respectively by direct attachment of materials having the same heat sealing characteristics, the lining material and the outer covering may be selected and arranged in proper sequence in the layers to obtain maximum strength, resistance to moisture in liquid or vapor phase, and other desired qualities without need to match to each other the heat sealing characteristics of the different sheet materials.

Although the packages are preferably made

by a continuous method, such as exemplified in Fig. 1 and other subsequent figures, it is to be understood that any of packages P, P1, P2, P3, P4 and P5 may be made individually, in which case both the lining and the outer covering may be made from pre-cut sheets, or by other continuous methods similar to those disclosed in Fig. 11 of U. S. Letters Patent 2,160,367 or Fig. 14 of U. S. Letters Patent 2,146,831 suitably modified however, as herein disclosed, to provide for lining of the package and for formation of outer seals beyond the lining seals. A preferred apparatus, capable with modification of its sealing tools to perform the method described in connection with Fig. 1 is illustrated and described in Zwoyer Patent #1,986,422.

In the modified method and apparatus shown in Fig. 5, the outer continuous tube T1, corresponding with tube T of Fig. 1, comprises two webs W2, W3 of webbing material removed respectively from rolls R2 and R3. Upon each of the webs W2 and W3 during its feed toward the former member f, there is deposited a series of lining elements each destined to form one-half of the lining of a container. Specifically, the lining elements L3, fed from a stack thereof, or as shown, cut from web W3, are disposed in spaced relation to each other lengthwise of the web W3. Similarly, the lining elements L2 are fed from a stack or cut from a web W2 and deposited in spaced relation to each other lengthwise of the covering web W2.

As the webs W2 and W3 are shaped about the former member f to form the continuous outer tube T1, the pairs of lining elements disposed upon these webs are concurrently shaped to form a series of tubular sections within, and spaced lengthwise of, the outer tube T1. On each of the opposite sides of the former member f, there are disposed a pair of sealing tools 6, 6 for pressing together and effecting thermoplastic joinder of the margins of the webs W2 and W3 to form the seams or seals S4, S4 extending lengthwise of the outer tube T1, Fig. 6.

There are also disposed on each of the opposite sides of former member f, a pair of sealing tools 7, 7 (not shown) for effecting joinder of the lengthwise edges of a pair of lining elements L2, L3, thus to form the inner seals S3, S3.

The feed of the webs W, W3 over the former member f may be effected as described in connection with Fig. 1 by a pair of gripper elements 5, 5, which may also serve as end sealing elements. Specifically, as shown in Fig. 1 the grippers 5, 5 may carry or comprise two independent sets of sealing tools 8, 8 and 9, 9, the former serving to flatten the outer tube f between the adjacent ends of successive lining sections and apply heat and pressure thereto to produce a seal S2 transversely of the outer tube T1, and the latter pair serving to flatten and effect sealing of aforesaid adjacent ends of two successive lining sections. In cross section lengthwise of the tube T1, the individual containers are the same as shown in Fig. 2.

The other steps of filling the containers and detaching them from the webbing after final sealing are the same as discussed in connection with Fig. 1.

Referring to Fig. 7, which shows the completed package P1, each of the outer seals S2, S2 S4 S4 is formed by direct attachment to each other of portions of the webs W2, W3 which preferably are of the same material, or at least comprise or have applied thereto adhesives of the same characteristics. Each of the inner seals S3, S3, S5, S5 is formed by direct attachment to each other of marginal portions of a pair of lining elements L2, L3 preferably of the same material or which at least comprise, or have applied thereto, adhesives of the same or similar characteristic.

In this, as in all other modifications herein described, the sheet materials comprising the inner and outer containers, or lining and covering, may be of the same composition or preferably and usually are of different compositions to procure desirably different qualities of the lining and covering; for example, when the filling in the packages is fluid or semi-solid, such as oil or grease, the lining is preferably of paper coated or impregnated with a substance or combination of substances rendering it liquid-proof, and the outer covering may be Pliofilm or Cellophane, whereas when the filling in a package is a solid, one or many pieces, the lining may be of Pliofilm, or equivalent, and the covering of glassine or other equivalent paper. In general, the choice of lining and covering materials will in each case be influenced or determined by the nature of the filling; this choice is not, as heretofore, restricted by any need to match the sealing characteristics of the lining and covering materials, because none of the seals are formed by attachment of the lining to the covering.

In general, the method illustrated by Fig. 8 is similar to that shown in Fig. 1, in that a series of lining elements are disposed upon a single web of a covering material as it is fed toward a former member f; therefore, only those respects in which the methods differ are specifically discussed. The method and arrangement shown in Fig. 8 is particularly suited to those instances in which the lining elements are not made of a material which is itself a thermoplastic and to which it is necessary to apply adhesive to effect sealing of the inner container. Specifically, there is applied to each of the four edges of each lining element a band or stripe of adhesive; for example, and specifically, the stencil 12A applies the stripe 11 of adhesive to the leading end of each lining element L4, the stencil 12B applies the band or stripe 13 of adhesive to the trailing end of each lining element L4, and the transfer rolls 14, 14 apply stripes 15 of adhesive to the longitudinal edges of each of the lining elements L4.

The reciprocating bars 16, 17, movable toward and away from the stencils 12A, 12B respectively, and the rolls 18 co-acting with the adhesive-applying rolls 14, 14 are all preferably heated to soften the thermoplastic comprised in or constituting the web 8 to effect adhesion thereto of the lining elements, at least sufficiently to prevent their displacement with respect to each other, or to the web W8 during feed of the composite webbing toward and about the former member f.

The adhesive applied by the stencils and rolls 14 may be of any suitable type; it may, for example, be a glue which remains unset during feeding and shaping movements of the lining elements, or it may be a quick-drying thermoplastic which is reactivated by sealing tools 7, 7 and 9, 9.

In any of the modifications shown in Figs. 1, 5 and 8, as well as in any of the modifications subsequently described, the lining elements may be single or multi-ply, and in the latter

5/-0

case may be the same or different materials, specifically referring to Figs. 8, 9, the web W7 from which the lining elements L4 are cut is a two ply web of prestretched "Pliofilm." This webbing is made from two webs of "Pliofilm" which are stretched in different directions and pressed together while heated to suitable temperature. However, such prestretched "Pliofilm" is not suited itself to form a seal when subjected to heat and pressure and it is, therefore, necessary as previously described, to apply thereto the aforesaid bands or stripes 11, 12 and 15 of adhesive, whose heat sealing characteristics may be the same as, or usually different from, the thermoplastic comprised in or constituting the web W6.

The steps of forming the longitudinal seals S, S1, and the end seals S2, S2, are substantially the same as described in connection with Fig. 1 and their description need not be repeated.

As more clearly appears in Figs. 10, 11, the inner container or lining comprises two layers or plies 19, 20 integrally bonded or joined to each other within an outer covering or container T. All of the outer seals S2, S2 and S are formed by direct thermoplastic attachment to each other of portions of the sheet material W6, and are all outside or beyond the corresponding seals S3, S3, and S1 of the inner container. The aforesaid seals of the inner container are entirely within the outer seals so that, as previously stated, the inner and outer seals may be formed respectively under those different conditions of pressure, temperature and time best suited to the different adhesive utilized.

In the modifications previously herein described, the lining elements are substantially narrower than the continuous webbing and are so spaced thereon as to leave clear the margins of the webbing to be joined for formation of the longitudinal seam S of Figs. 1 and 8, or of the longitudinal seams S4, S4 of Fig. 6. In the modification shown in Fig. 13, the lining elements L5 are the same width as the web W upon which they are disposed with their longitudinal edges substantially flush with the edges of web W; direct attachment to each other of the longitudinal edges of the lining elements, and direct attachment to each other or the margins of the webbing W are insured by departing from the projecting type of seal shown in the previous modification and by recourse to the type of seal shown in Figs. 13, 14 in which the overlapping margins of the linings are substantially flush with the periphery of the inner container and the overlapping margins of the outer webbing W are substantially flush with the periphery of the outer tube T. As more clearly appears in Fig. 14, the seal S7 comprises the directly attached margins of the lining element L5 which may, for example, be of "Pliofilm," and the outer seal S8 comprises the overlapping and directly attached margins of the outer container or covering which may, for example, be of a different thermoplastic material such as Cellophane. In this modification a single sealing tool 21 forms both the inner and outer longitudinal seams.

To avoid the limitation use of this single seal may impose upon the selection of materials, the lining elements whether of width equal to, greater than, or less than the width of web W may be staggered or offset; thus, to insure when the web and lining elements are shaped about former 1, stagger, or offset, of the seams S7, S8, as shown in Fig. 17.

The subsequent steps of transversely sealing, filling, and detaching the filled containers may be the same as previously described in connection with Fig. 1 and, or as shown in Figs. 13, 15, and 16 the double walled tubing of Figs. 14 and 17 may be shaped into packages or containers having squared ends. A suitable arrangement for producing this type of package is disclosed and claimed in co-pending application Serial #297,481 of Sonneborn & Albertson.

As the composite webbing is fed beyond the end of the former 1, the tucking tools 22, 22 crease the opposite sides of the tube T and tend to tuck the lining and covering materials between two plates 23, 23 depending from the lower end of the former member 1. As the clamping members 5, 5 move toward each other to the position shown in Fig. 16, the lower ends of the plates 23, 23 are bent thereby toward each other, whereupon the tucking tools 22, 22 produce inturned folds or tucks in the opposite sides of the tube T in the path of the sealing tools carried by the clamping members 5, 5. The members 24, 24 grip the tubing below the seal S2 and support the previously formed packages, thus to relieve the seal during its formation from the weight of the previously filled containers. As the clamp members 5, 5 move downwardly from the position shown in Fig. 16, they continue to move closer to each other to effect engagement with the webbing of two sets of sealing tools which, in accordance with my present invention, are suited to subject the webbing and lining materials to different temperatures.

The second set of gripping tools 25, 25 are effective, as more fully described and claimed in application Serial No. 259,748 of Sonneborn & Albertson, to relieve the seal, while heated, from the web-feeding strain.

The tendency of the web, or of the lining elements, or of both of them, to wrinkle, or crease, as they are shaped about former 1 may be avoided by recourse to a modification of the method and apparatus described and claimed in my application, Serial No. 306,059, filed Nov. 25, 1939. Referring to Figs. 19 to 22 hereof, the web W is notched or slitted by the knives 26 to define a series of blanks integrally attached to the webbing and each comprising one of the lining elements L whose relation to the web W may be any of those previously described in connection with Figs. 1, 8, 13, and 18.

As each blank in turn enters the mouth of the funnel 27 and passes downwardly about former 1, it is shaped to form an outer tubular section of web W and a shorter, inner tubular section comprising one of the lining elements L.

In the particular arrangement shown in Fig. 19, the longitudinal inner and outer seams S and S8 project from the inner and outer containers generally as described in connection with Fig. 1, but it is to be understood these seams may be of the flush type described in connection with Figs. 14 and 17.

Reverting to Fig. 19, the funnel 27 is provided with a slot 28 extending upwardly from the lower smaller end of the funnel in direction substantially parallel of the axis of former member 1. The wedge shaped structure 29 disposed between the funnel and the former member 1, preferably attached to member 1, directs the longitudinal edges of the lining elements and the margins of the web W into and through the slot 28, as shown in Fig. 19. The subsequent steps of sealing the longitudinal edges of the inner and outer containers, the filling of the containers,

5/50

the independent closure of the ends of the inner and outer containers, and the detachment of filled containers are the same as previously described in connection with Fig. 1.

The slits or notches 30 are, as shown in Fig. 20, disposed within the flattened area of adjacent end seals 82; the knives 10 in detaching a filled container from the webbing may, as shown in Fig. 20, sever the webbing along a line which in effect is a continuation of the notching and slitting; or as disclosed in Fig. 24, a double set of knives 10 may remove a narrow band of webbing whose sides are substantially parallel to and on opposite sides of slits 30.

To avoid repetition, those elements in Fig. 19 corresponding with elements of preceding modifications are identified by reference characters appearing in those modifications, to the description of which reference is made for discussion of their purposes and functions.

It shall be understood the terms "seals" and "sealing" when appearing unqualified in the appended claims are not limited to heat-seals or heat-sealing, but also comprehend seals or sealing which do not involve application of heat, for example, seals formed by application of pressure to surfaces freshly coated with cold glue or the like.

What I claim is:

1. A method of producing lined containers which comprises shaping sheet lining material and joining edges thereof to form a tubular section, shaping sheet covering material and joining edges thereof to form a second tubular section enclosing, and projecting beyond an end of, the inner tubular section, sealing said end of the inner tubular section, and sealing the outer tubular section beyond the sealed end of the inner section.

2. A method of producing lined containers which comprises concurrently shaping sheet lining material and sheet covering material to form an inner tubular section of lining material and a longer, outer tubular section of covering material, joining edges of the lining material and of the covering material to form seals extending lengthwise of said tubular section, sealing an end of the inner tubular section, and sealing the longer outer tubular section beyond said end of the inner section.

3. A method of producing lined containers which comprises shaping sheet lining material and joining edges thereof to form a tubular section, shaping sheet covering material and joining edges thereof to form a second tubular section enclosing, and projecting beyond an end of, the inner tubular section, flattening and sealing said end of the inner tubular section, and flattening and sealing the outer tubular section beyond the flattened sealed end of the inner section.

4. A method of producing lined containers which comprises concurrently shaping sheet lining material and sheet covering material to form an inner tubular section of lining material and a longer outer tubular section of covering material, joining edges of the lining material and of the covering material to form seals extending lengthwise of said tubular section, transversely flattening and sealing an end of the inner tubular section, and flattening and sealing the longer outer tubular section beyond said end of the inner section.

5. A method of producing lined containers which comprises concurrently shaping sheet lining material and sheet covering material to form an inner tubular section of lining material and a longer outer tubular section of covering material, joining edges of the lining material and of the covering material to form seals extending lengthwise of said sections, and transversely sealing an end of the inner tubular section and substantially concurrently sealing the longer tubular section beyond said end of the inner section.

6. A method of producing lined containers which comprises shaping sheet lining material and joining edges thereof to form a tubular section having at least one seal extending lengthwise thereof and outwardly therefrom, shaping sheet covering material and joining edges thereof to form a second tubular section longer than and outside of said first named tubular section and having at least one seal extending lengthwise thereof and outwardly therefrom, transversely sealing at least one end of said inner tubular section, and transversely sealing an end of the outer tubular section beyond the corresponding sealed end of the inner tubular section.

7. A method of producing lined containers which comprises shaping sheet lining material and joining edges thereof to form a tubular section having a seal extending lengthwise thereof and substantially flush with its periphery, shaping sheet covering material and joining edges thereof to form a second tubular section longer than and outside of said first named tubular section and having a seal extending lengthwise thereof and substantially flush with its periphery, transversely sealing at least one end of said inner tubular section, and transversely sealing an end of the outer tubular section beyond the corresponding sealed end of the inner tubular section.

8. A method of producing lined containers which comprises shaping sheet lining material and sheet covering material, of greater area than an area of said sheet lining material, to form a tubular section of lining material having a flush seal extending lengthwise thereof, and shaping a longer outer tubular section of covering material having a flush seal overlying aforesaid seal of the inner section, transversely flattening and sealing at least one end of said inner tubular section, and transversely flattening and sealing the outer tubular section beyond the corresponding sealed end of the inner tubular section.

9. A method of producing lined containers which comprises shaping sheet lining material and sheet covering material, of greater area than an area of said sheet lining material, to form a tubular section of lining material having a flush seal extending lengthwise thereof, shaping a longer outer tubular section of covering material having a flush seal staggered with respect to aforesaid seal of the inner section, transversely flattening and sealing at least one end of said inner tubular section, and transversely flattening and sealing the outer tubular section beyond the corresponding sealed end of the inner tubular section.

10. A method of producing lined containers which comprises shaping at least two lining elements of sheet material and joining edges thereof to form a tubular section, shaping at least two longer elements of sheet material and joining edges thereof to form a second tubular section outside of and extending beyond an end of said first named inner tubular section, sealing said end of the inner tubular section, and sealing the

5/51

Plaintiff's Exhibit 5

outer tubular section beyond said sealed end of the inner tubular section.

11. The method of producing lined containers which comprise feeding web material having lining elements spaced lengthwise thereof, shaping the web-material and the lining elements to form a succession of spaced tubular lining sections within a continuous outer tube, longitudinally sealing said tube and said tubular lining sections, and therefrom defining containers by transversely sealing said tube between adjacent tubular sections and transversely sealing at least one end of each of said tubular sections.

12. The method of producing lined containers which comprises feeding a web of covering material having lining elements of sheet material spaced lengthwise thereof, progressively shaping the web and the lining elements to form a succession of spaced tubular lining sections within a continuous outer tube, progressively joining to each other the edges of the web to form a seal extending lengthwise of said tube, progressively joining to each other the longitudinal edges of each of said tubular sections to form a seal extending lengthwise thereof within said outer tube, transversely flattening and sealing the tube between the ends of adjacent tubular sections, and transversely flattening and sealing the ends of the tubular sections.

13. The method of producing lined containers which comprises feeding, shaping and joining webs of covering material progressively to form a continuous tube, concurrently feeding and shaping lining elements spaced lengthwise of said web to form a succession of spaced tubular sections within said outer tube, transversely sealing the tube between the end of successive tubular sections of lining, and transversely sealing at least one end of each of said tubular sections.

14. A method of producing lined containers which comprises concurrently shaping sheet lining material of certain sealing characteristic and sheet covering material of different sealing characteristic to form an inner tubular section and a longer, outer tubular section, closing said inner tubular section to form an inner container by sealing together portions of said sheet lining material under the conditions of temperature, pressure, or time suited to its sealing characteristics, and closing said outer tubular section to form an outer container by sealing together portions of said sheet covering material under the different conditions of temperature, pressure or time suited to its sealing characteristic.

15. A method of forming, filling and sealing lined packages which comprises feeding a web having lining elements spaced lengthwise thereof, transversely partially severing the web between successive lining elements to define a series of blanks integrally attached to the web and each associated with one of said lining elements, thereafter shaping each of the blanks in succession simultaneously to form a tubular lining and a longer and outer tubular section of the web joined thereto by the unsevered portion thereof, attaching to each other longitudinal margins of the inner and outer tubular sections, transversely and in succession sealing the ends of each inner tubular section, filling each inner tubular section after so sealing one end thereof, transversely sealing adjacent ends of outer tubular sections throughout an area within which lie severed and unsevered portions of the web, and detaching each of the filled lined packages by severance from the web through one of said areas.

16. Apparatus for shaping webbing into tubular form comprising a former member, a funnel-like member surrounding said former member and having a slot extending longitudinally from its smaller end, a wedge-shaped member disposed between said members for turning outwardly into said slot margins of the webbing shaped about said former member, and means beyond said slot for attaching said margins to each other.

17. Apparatus for shaping webbing into tubular form comprising a former member, means for feeding the webbing with respect to said former member, a funnel-like member surrounding said former, converging in the direction of feed of the webbing, and having a slot extending longitudinally from its smaller end, a wedge-shaped member disposed between said member and diverging in the direction of feed of the webbing to turn margins of the webbing outwardly from said former member and through said slot, and means beyond said slot for attaching said margins to each other.

18. Apparatus for producing lined containers from webbing having lining elements spaced lengthwise thereof comprising a former member, means for feeding the webbing with respect to the former member, means for slitting the webbing transversely between successive lining elements, structure for curling the webbing and concurrently the lining elements, in avoidance of creasing, about said former member to form a series of tubular lining sections within, and between slits extending partially across, an outer tube of webbing.

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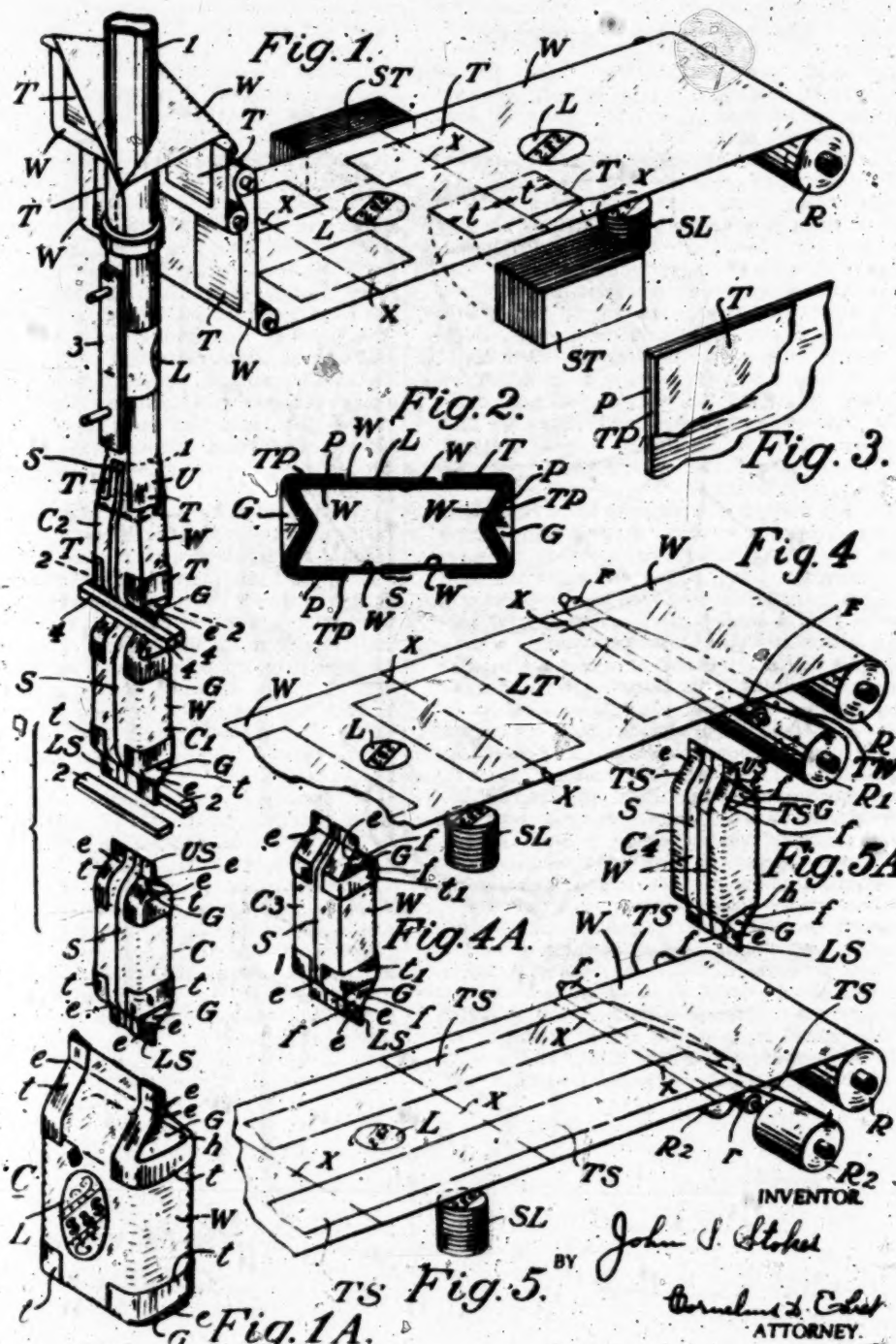
5/82

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,259,866

METHOD OF MAKING CONTAINERS

Filed June 3, 1939 4 Sheets-Sheet 1



5/93

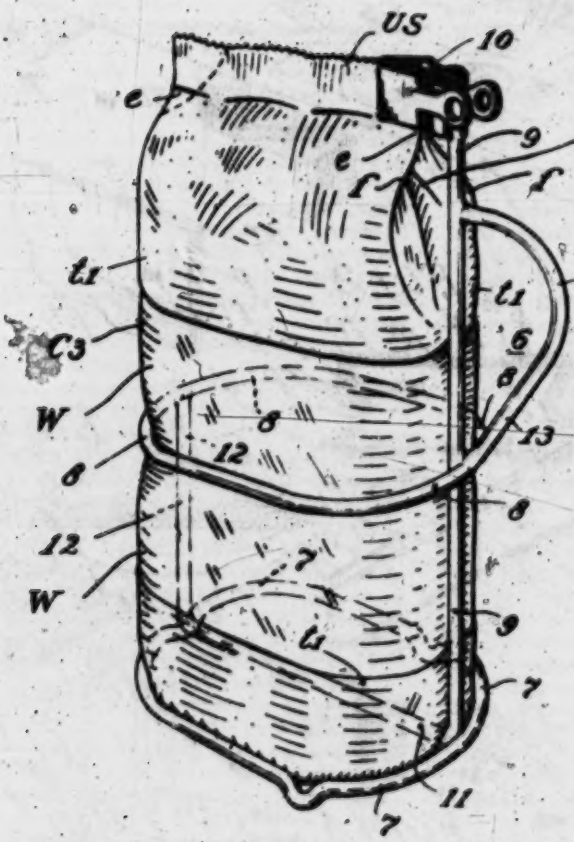
192

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,259,866

METHOD OF MAKING CONTAINERS

Filed June 3, 1939 4 Sheets-Sheet 2



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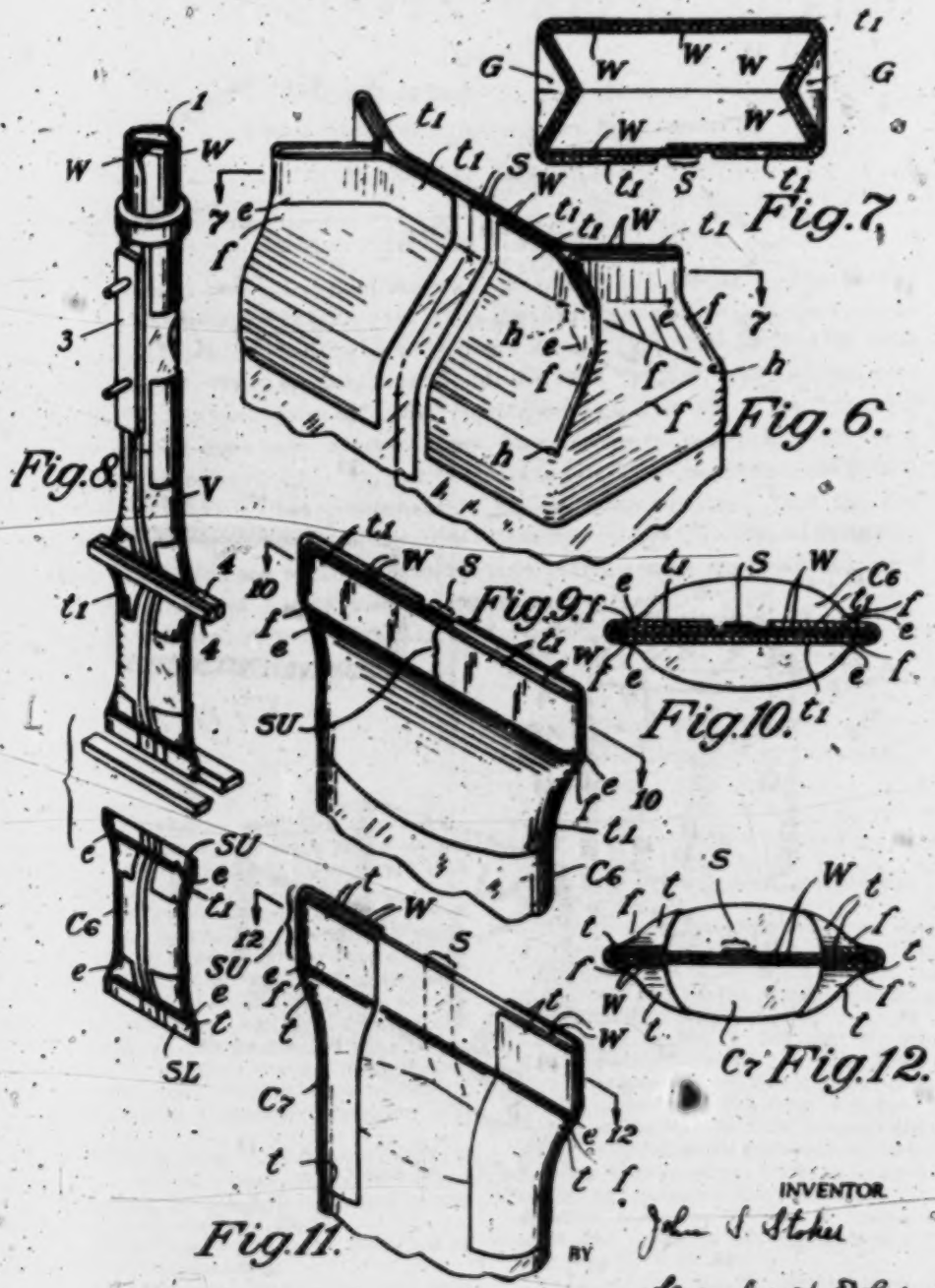
5/94

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,259,866

METHOD OF MAKING CONTAINERS

Filed June 3, 1939 4 Sheets-Sheet 3



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Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,259,866

METHOD OF MAKING CONTAINERS

Filed June 3, 1939 4 Sheets-Sheet 4

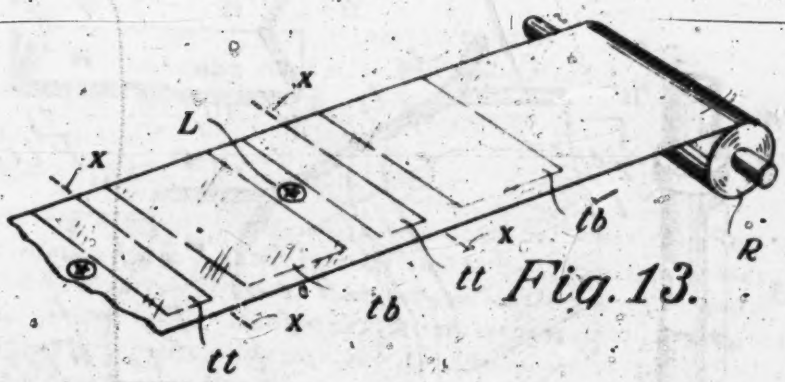

Fig. 13.

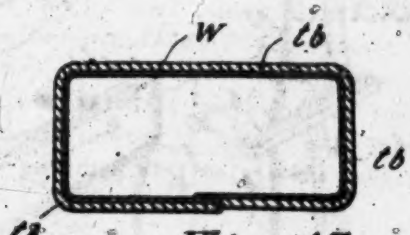

Fig. 15.

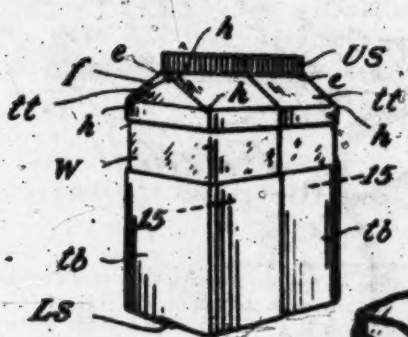

Fig. 14.

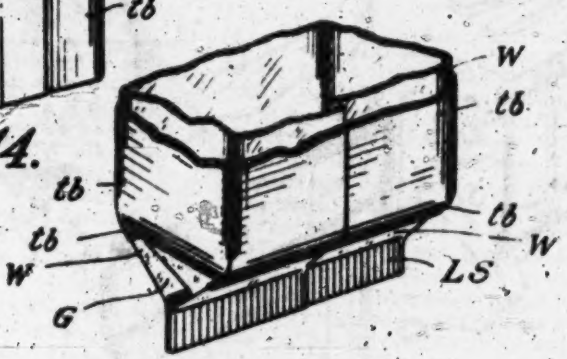

Fig. 16.

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5/97

Plaintiff's Exhibit 5

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UNITED STATES PATENT OFFICE

2,259,866

METHOD OF MAKING CONTAINERS

John S. Stokes, Huntingdon Valley, Pa., assignor

CERTIFICATE OF CORRECTION.

Patent No. 2,259,866. October 21, 1941.

JOHN S. STOKES.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 32, strike out the comma after "14"; line 48, for "a" read --at--; page 2, first column, line 54, for the word "label" read --labels--; line 54-55, for "autogeneous" read --autogenous--; line 69, after "pulling" insert --of--; same page, second column, line 47, for "piles" read --plies--; page 3, first column, line 22, for "reenorcing" read --reenforcing--; line 23, for "one half" read --one-half--; page 4, second column, line 35, for the word "constructions" read --constrictions--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of November, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

accordance with another modification of my invention, the reenforcing elements are so spaced transversely and longitudinally of the web that each of the four corners of the container is reenforced by an individual reenforcing element; in still another modification, reenforcing strips spaced from each other and from the edges of the web are continuously applied longitudinally of the web to provide reenforcement for all corners of the containers, and by the same elements or strips to provide for stiffening or reenforcement of opposite sides of the containers.

My invention further resides in the methods of making containers hereinafter described and claimed.

For an understanding of my invention and for illustration of various containers and methods of producing them, reference is to be had to the accompanying drawings, in which:

Fig. 1 in perspective illustrates formation of reenforced containers;

Fig. 1A is a perspective view on enlarged scale of one of the containers formed by the method of Fig. 1;

Fig. 2 is a plan view, in section and on enlarged scale, taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary view, in perspective and on enlarged scale, of a reenforcing element;

Fig. 4, in perspective, illustrates a modification of the method of Fig. 1;

[illegible] of Fig. 4;

Fig. 14 is a perspective view of a package made from the web shown in Fig. 13;

Fig. 15 is a plan view in section taken on line 15—15 of Fig. 14;

Fig. 16, in perspective, shows the lower end of the package of Fig. 14, before flattened.

In Figs. 2, 3, 6, 7, 10, 12 and 15, the thickness of the web and of the reenforcing material is exaggerated for clarity.

Referring to Fig. 1, the web W, preferably of Cellophane, "Pliofilm", or the like, coated with, impregnated with, or consisting of thermoplastic material, is fed from a supply roll R thereof to the tubular form 1 about which it is shaped, as hereinafter described, to form a tube U sealed transversely at intervals to form a succession of containers filled through form 1 and detached from the webbing by knives 2, 2 or equivalent, all as more fully described in Dwoyer U. S. Patent #1,986,422.

In accordance with the method shown in Fig. 1, preferably while the web W is at rest between successive feeding movements thereof toward form 1, there is attached to its surface, preferably that surface destined to be the outer side of each container, a pair of reenforcing elements T, preferably of paper, cloth, or similar or equivalent sheet material, either coated with adhesive for attachment to the web W, or coated or im-

5/87

Plaintiff's Exhibit 5

Patented Oct. 21, 1941

2,259,866

UNITED STATES PATENT OFFICE

2,259,866

METHOD OF MAKING CONTAINERS

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Sammerdale, Pa., a corporation of Pennsylvania

Application June 3, 1939, Serial No. 277,132

12 Claims. (Cl. 93—3)

My invention relates to methods of making containers of pliant material, particularly moisture-proof Cellophane, "Pliofilm" and like thermoplastic materials.

In accordance with one aspect of my invention, reenforcing strips or elements of paper, cloth or any other suitable sheet material are regionally applied to the web, from which the containers are made, to those areas thereof in which it is sharply bent during the seal or end-forming operations; preferably, the reenforcing strips or elements are applied to the web at a station intermediate a supply roll from which the web is drawn or fed and a tubular form about which it is shaped and its edges joined to form a tube subsequently transversely flattened, at intervals longitudinally thereof, by heated tools to form seals which define filled containers or packages.

In accordance with one modification of my invention, the reenforcing elements are so spaced longitudinally of the web and extend to such distance transversely of it that each of the ends of the containers made therefrom is substantially completely encircled by reenforcing material; in accordance with another modification of my invention, the reenforcing elements are so spaced transversely and longitudinally of the web that each of the four corners of the container is reenforced by an individual reenforcing element; in still another modification, reenforcing strips spaced from each other and from the edges of the web are continuously applied lor tudinally of the web to provide reenforcement for all corners of the containers, and by the same elements or strips to provide for stiffening or reenforcement of opposite sides of the containers.

My invention further resides in the methods of making containers hereinafter described and claimed.

For an understanding of my invention and for illustration of various containers and methods of producing them, reference is to be had to the accompanying drawings, in which:

Fig. 1 in perspective illustrates formation of reenforced containers;

Fig. 1A is a perspective view on enlarged scale of one of the containers formed by the method of Fig. 1;

Fig. 2 is a plan view, in section and on enlarged scale, taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary view, in perspective and on enlarged scale, of a reenforcing element;

Fig. 4, in perspective, illustrates a modification of the method of Fig. 1;

Fig. 4A, in perspective, illustrates a package formed by the method of Fig. 4;

Fig. 4B, in perspective, illustrates the container of Fig. 4A in its carrier or holder;

Fig. 5, in perspective, illustrates another modification of the method of Fig. 1;

Fig. 5A is a perspective view of a container formed by the method of Fig. 5;

Fig. 6, in perspective, shows another type of container formed by the method of Fig. 1;

Fig. 7 is a plan view, in section, taken on line 7—7 of Fig. 6;

Fig. 8 illustrates a method of forming pillow-shaped packages;

Fig. 9 is a perspective view on enlarged scale of an end of a package made from the web of Fig. 4 by the method of Fig. 8;

Fig. 10 is a plan view taken on line 10—10 of Fig. 9;

Fig. 11, in perspective and on enlarged scale, illustrates the end of a package made from the web of Fig. 1 by the method of Fig. 8;

Fig. 12 is a plan view, in section, on line 12—12 of Fig. 11;

Fig. 13, in perspective, illustrates a further modification of Fig. 1;

Fig. 14 is a perspective view of a package made from the web shown in Fig. 13;

Fig. 15 is a plan view in section taken on line 15—15 of Fig. 14;

Fig. 16, in perspective, shows the lower end of the package of Fig. 14, before flattened.

In Figs. 2, 3, 6, 7, 10, 12 and 15, the thickness of the web and of the reenforcing material is exaggerated for clarity.

Referring to Fig. 1, the web W, preferably of Cellophane, "Pliofilm", or the like, coated with, impregnated with, or consisting of thermoplastic material, is fed from a supply roll R thereof to the tubular form 1 about which it is shaped, as hereinafter described, to form a tube U sealed transversely at intervals to form a succession of containers filled through form 1 and detached from the webbing by knives 2, 2 or equivalent, all as more fully described in Zwoyer U. S. Patent #1,986,423.

In accordance with the method shown in Fig. 1, preferably while the web W is at rest between successive feeding movements thereof toward form 1, there is attached to its surface, preferably that surface destined to be the outer side of each container, a pair of reenforcing elements T, preferably of paper, cloth, or similar or equivalent sheet material, either coated with adhesive for attachment to the web W, or coated or im-

5/88

pregnated with a thermoplastic for attachment to the web by application of heat and pressure. As indicated in Fig. 3, each reenforcing element or tab T may comprise a sheet of paper P suitably attached to a sheet TP of thermoplastic material, serving to attach tab T to web W.

In any event, each pair of elements T, T, as applied or attached to web W, are spaced from each other transversely of the web and from at least one of the longitudinal margins of the web; the distance between lines *x*, *x*, Fig. 1, not actually appearing on the web, corresponds with the length of the containers to be cut from the web; elements T, T, or the corresponding reenforcing members herein subsequently described, need not, however, be spaced from either edge of the web when the overlapping margins of the web are joined as in Figs. 8, 10, and 14 of Maxfield Patent #2,146,831 to extend outwardly from the tube formed from the web.

At the same station at which the reenforcing elements are applied and, in any event, preferably before the web is shaped about the form f, there is attached to it, preferably on the face thereof destined to be the outside of a container, a series of labels L, usually of paper, having thereon printed descriptive or decorative matter, desirably appearing on the finished containers yet expensive to print directly upon the web W; alternatively, or in addition, the reenforcing elements T, T may bear thereon printing or decorative matter.

The web W, with the regional or locally applied reenforcing elements T and label L thereon, is shaped about the form f to bring the margins or edges of the web, free throughout of reenforcing material, into overlapping relation. The web margins so overlapped are joined, as by application of heat and pressure when the web is of, or coated or impregnated with, thermoplastic material, to form a seam S extending longitudinally of the tube U. Preferably heat and pressure are applied by platen 3, generally of the type described and claimed in copending Sonneborn et al. application Serial #259,748, which is moved into engagement with the overlapping margins while the web material is at rest, and is out of contact with the web during its feed.

The tube U is divided longitudinally into containers, by the heated tools 4, 4 which move toward each other to flatten the tube U between them below the open lower end of the tubular form f and so form, across the tube, an autogenous seal section subsequently divided by knives 2, 2 or equivalent into a seal US closing the top of a filled container, such as C1, and a seal LS closing or forming the bottom of another container, such as C2. Thereafter, the tools 4, while clamping the tube U between them, move downwardly, to the position shown in Fig. 1, to extent substantially corresponding with the desired length of the successive containers; thereupon the tools 4, 4 separate sufficiently to clear the sides of container C2 and return to their original position. Particularly when the web W is of "Pliofilm," the heated seal sections should not be subjected to feeding tension; in such case, pulling the web over form f may be effected, as disclosed in aforesaid Sonneborn et al. application, by unheated clamping tools operating substantially concurrently with the tools 4, 4, but engaging the web at some distance above the heated tools 4, 4.

While the web W is at rest between the successive feeding movements of the tools 4, 4 or of the auxiliary feeding clamps, another pair of reenforcing elements T, T is applied, as above described, to the web material en route to the tubular form f.

In accordance with the method of Fig. 1, prior to clamping of the tube U by the seal-forming tools 4, 4, the opposite sides of the tube are tucked in, generally as shown in Fig. 2, to form gussets G within the areas or limits of a pair of reenforcing elements T, T. Consequently, each transverse seal section formed by the tools 4, 4 includes at its ends both the tucked-in web material and the reenforcing material overlying it. The reenforcing material overlaps the seal section proper and adjacent areas of the containers, particularly the constrictions of the container at and adjacent the seal; and what is even more important, the reenforcing material strengthens the web material at the sharp bends produced during sealing and formation of the gusset fold, such as and especially those at *h*, most clearly shown in Fig. 6.

The knives 2, 2 or equivalent, when cutting across a transverse seal section substantially midway thereof, also cut across a pair of reenforcing elements T, T substantially along one of aforesaid lines *x*, so that each of a pair of reenforcing elements T, T is divided into reenforcements *t* for the lower end of one container C1 and another pair of reenforcements *t* for the upper end of the adjacent container C. Therefore, each filled container C, Fig. 1, as detached from the tube U, is closed at its upper end by a transverse seal US and, at its lower end by a similar transverse seal LS, with each of the four corners of each seal individually reenforced by an element *t* which is included within and strengthens the web within the gusset fold at that corner, which bridges the junction between an inner corner *e* of the seal (LS or US) and the body of the container, and which reenforces the constrictions of the container material near the inner corner *e* of the seal (LS or US). When the reenforcing elements T, T are themselves of thermoplastic material or are coated on both faces with adhesive, all adjacent layers or piles of webbing and reenforcing material at the ends of the transverse seals are bonded or joined to each other as distinguished from Fig. 6, hereinafter described.

Provision of the gusset folds G allows the bottoms of the containers, Fig. 1A, to be squared or flattened for display on shelves, or to suit a carrier or holder; or both ends of the containers may be squared for their packing or shipment. Preferably, as shown, the reenforcement elements *t* are of such dimensions that they embrace the corners of the containers so squared.

In accordance with the method of Fig. 4, for each pair of reenforcing elements T, T of Fig. 1, there is substituted a single long tab LT whose length measured transversely of the web is sufficient substantially to encircle a finished container, Fig. 4A.

The tabs LT may be fed from a stack thereof, or, as shown in Fig. 4, they may be cut in succession from web TW stored on roll R1. During feed of web W, the leading end of web TW is progressively drawn over idler roll r into engagement with the under face of web W, and is cut when the extent of web TW so fed corresponds with the desired width of an element LT as measured longitudinally of the web W. The attachment of the reenforcing material, as in other

5/89

forms of my invention, may be effected by adhesive or by application of heat and pressure when the web TW is surfaced with or consists of a thermoplastic material. As in the method of Fig. 1, the distance between the successive lines *x*, *x* of the reenforcing elements substantially corresponds with the desired length of a container.

The subsequent steps of shaping the webbing with the regionally applied reenforcing elements LT thereon about a form, such as form 1, Fig. 1, of joining the margins of the web to form a tube, of tucking in sides of the tube to form gussets, and of sealing the tube transversely at intervals longitudinally thereof to form containers, are generally like those described in connection with Fig. 1.

The resultant package, shown in Fig. 4A, is closed at its upper and lower ends by the transverse seals US and LS, respectively; at each end the package is approximately entirely encircled by a reenforcing element *l1*, of width substantially equal to one half of the width of the reenforcing element LT as applied to the web W. Each of the reenforcing elements *l1* overlies the associated seal (US or LS) and constrictions of the package adjacent the seal, and in particular, overlies the constrictions *f*, *h* in the container wall adjacent the inner corners *e* of the seals and defining or within the gusset G.

With this form of package, like that shown in Figs. 1 and 1A, the portion of the package between its ends is free of reenforcing material, so leaving the contents of the package visible for inspection if web W be of transparent or translucent material, such as Cellophane or Pliofilm.

In this and all the other modifications herein described, the reenforcing elements may have color or colors different from the color of the web material W for decorative or other purposes, in addition to increasing the strength of the container at points or regions particularly susceptible to breakage.

In accordance with the method shown in Fig. 5, the reenforcing material is applied to the webbing W in the form of two strips TS, TS spaced from each other transversely of the web and spaced from the longitudinal edges of the web. The strips TS may be fed over idler roller *r* from supply rolls R2, R2 thereof during each feeding movement of the web W and to extent corresponding with the length of a container.

The package or filled container resulting from subjecting the locally reenforced webbing so formed to the steps described in connection with Fig. 1, is shown in Fig. 5A; each package C6 is sealed at its upper and lower ends by the transverse seals US and LS, respectively, and each of two opposite sides of the package is covered by a reenforcing strip which, at its upper and lower ends, forms part of the corresponding ends of the transverse seals. The contents of package C6 are visible through the uncovered region of webbing W extending from top to bottom of the front and rear faces of the container between the reenforcing strips TS.

In Fig. 5A, as in each of the preceding modifications and those subsequently described, the reenforcing material overlies the constrictions in the container wall at and adjacent the inner corners *e* of the upper and lower seals US, LS; it additionally reenforces the web W at and within the gusset folds G, so preventing the container from breaking open along the creases or constrictions within the gusset fold.

Containers reenforced as herein described are suitable for packaging of a wide variety of materials, including liquids, such as milk, oil, or the like and various powdered solids, such as sugar or flour; the filling is sealed against the atmosphere, and especially in the case of edibles particularly in the case of milk, the filling is delivered in a container only once usable and reaches the user in optimum condition because the container has never before been used, and the filling is free of germs or other effects otherwise present from previous use of the container or from exposure of the filling to the atmosphere.

For handling or transport of the filled containers, there may be provided individual holders or carriers 6 generally of the type shown in Fig. 4B. The exemplary form of carrier shown is fabricated from wire, suitably joined, as by soldering or welding, to form a framework upon and or within whose lower member or bottom 7 is supported the bottom of the container; upper ring 8 embraces and preferably laterally supports the container substantially midway thereof; and standard 9, attached to bottom 7 and ring 8, extends substantially the entire height of the bag. The clamp 10, detachably or permanently attached to the upper end of standard 9 of the carrier, is suited to grip and hold the upper seal US of the bag within the region of its hereinbefore described reenforcement. The cross member 11 of frame 6 extending from one side to the other of bottom ring 7 engages the bottom of the bag; member 11 is so oriented that when the bag is in proper position for clamping of its upper seal by clamp 10, the member 11 is substantially parallel with the lower seal rather than transverse thereof, in which latter case member 11 would not engage the reenforcing material. The short upright member 12 of the carrier 6 serves to maintain the proper spacing between the upper and the lower rings 8, 7.

The handle 13, also of wire, facilitates pouring of liquid from the container; during the pouring the container is maintained extended by engagement of clamp 10 with one corner of the seal US whose other corner is torn or cut off to form a lip or spout for discharge of the liquid or other filling.

The carrier or holder 6 generically represents any holder or carrier for containers of the type described, especially when the filling is liquid which causes the container to accommodate itself and conform with form and construction of the holder; more particularly, in the example illustrated, the bottom of the container accommodates or conforms itself more or less snugly in contact with the bottom 7 and cross member 11; and the sides of the container conform with and somewhat bulge at and around the uprights 9 and 12 and the member 8.

When the reenforcing elements or strips of Figs. 1, 4 and 5 are coated only on their web-engaging side with adhesive or other bonding substance, all layers of the ends of the seals US and LS are not bonded together as in the modifications previously described; on the contrary, as shown in Fig. 6, the ends of the seals are locked or divided. However, as in the preceding modifications, the tubing material overlies and reenforces all of the creases or constrictions *f*, *h* in the web material necessary for the formation of the gusset folds and construction of the seals.

Though particularly valuable for containers having gusset folds, my invention is not limited

5/90

thereto and to advantage may be used in the manufacture of filled containers of the pillow or lozenge type, shown in Figs. 8 to 12.

To make containers of the type shown by C6, Figs. 8 and 9, the web W corresponds with that shown in Fig. 4; that is, to the web there are applied at intervals, corresponding with the length of container, reenforcing elements which extend substantially entirely across the width of the container. The edges of the web are joined generally as described in connection with Fig. 1, and the tube V so formed is transversely sealed at intervals longitudinally thereof to form containers. However, unlike Fig. 1, the sides of the tube are not tucked in prior to flattening thereof by the heated clamping tools 4, 4; in consequence, gusset folds are not formed at the ends of the containers, Fig. 8. Each end of the container is substantially completely encircled by a reenforcing element *t4*, which overlies the constrictions *f* of the container at and adjacent the inner corners *e, e* of the associated seal SU or SL. As in all other modifications, the reenforcing material may terminate short of the longitudinal seam S. The relation of the tabbing elements *t1* to the container are shown in Figs. 9 and 10; they may be of thermoplastic material, or of paper, cloth, or the like, coated with adhesive or impregnated with thermoplastic material; and they may be suitably colored and/or bear printing and or descriptive or decorative matter.

The type of container or package shown in Figs. 11 and 12, of which it is characteristic that each of the corners of the pillow-shaped container is reenforced by an individual tab *t*, is made from a web such as shown in Fig. 1 by performing thereon the steps illustrated by Fig. 6 and described in connection therewith. As most clearly appears in Figs. 11 and 12, each of the tabs *t* embraces one corner of the container C1, overlies the seal end at that corner and also overlies the constrictions *f* in the container wall *e* and adjacent the junction of the seal with the container body.

The filled container or package C8, shown in Fig. 14, is similar to that of Fig. 4A except the inner reenforcement *tb* extends substantially higher on the package, for example, well over halfway or about two-thirds the distance from the bottom, and is of suitably stiff material so that when the package is in upright position, it has because of such reenforcement *tb*, considerable stability and does not tend to collapse or fall over even when its contents are liquid. For a substantial distance between the upper edge of reenforcement *tb* and the lower edge of reenforcement *tt*, the web W, of which the container proper is made, is clear of reenforcing material, permitting inspection of the package contents when the web is of Cellophane, "Pliofilm" or like material, which, to greater or less extent, is transparent.

Either or both of the reenforcing elements *tt, tb* may bear printing and or decorative matter to serve as a label; in addition, a label L, having no reenforcing function, may be applied to web W as hereinbefore previously described, to appear on the container in the gap *g* between the reenforcing elements.

To make packages similar to C8, Fig. 14, by a method corresponding with that described in connection with Fig. 1, a series of pairs of reenforcing elements *tt, tb* are applied to web W; preferably, the elements *tt, tb* and labels L, as used, are applied to web W between the supply roll R and the form F (Fig. 1) or equivalent; each of them may, as shown in Fig. 13, extend to one edge of the web W and terminate short of the other edge to permit direct contact of the overlapping margins of the web, Fig. 15, without interposition therebetween of the reenforcing material. The longitudinal seam S formed by joinder of the overlapping margins is, therefore, strong and not unduly thickened. If desired, the elements *tt, tb* may terminate short of both edges of the web, as illustrated in prior figures, or may, if a projecting seam is not objectionable, extend entirely across the web.

Preferably, the distance between the upper or right edge of each element *tt*, Fig. 13, and the lower or left edge of the next element *tb*, is such that the element *tb* in the finished container overlies and reenforces the corners of the container, Fig. 14, yet terminates substantially short of the lower seal, Fig. 16, thus insuring a bottom for the container, Fig. 11, which is substantially flat over its entire area and so contributes to stability of the package or container when standing in upright position.

As in all other modifications herein described, the web W is preferably of Cellophane, "Pliofilm", or like material, at least whose surface is thermoplastic; the reenforcing elements are preferably of suitably stiff material, for example, metallized craft paper; label L, preferably of paper, is also either thermoplastically or adhesively attached to web W.

The reenforcing elements *tt* and *tb* reenforce the corners of the package, the constructions and bends *f, h* in the web material adjacent and within the gusset folds; and, in addition, the reenforcing element *tb*, which substantially encircles the container for about two-thirds of its height, stiffens it against collapse. This container and all others of the square or intuck type herein shown are suited for use with the carrier of Fig. 4B.

What I claim is:

1. In the art of making containers, the method which comprises applying reenforcing elements to a web of pliant material at intervals of extents longitudinally of the web corresponding with the lengths of the containers, joining the edges of the web to form a tube, and flattening the tube sharply to bend the webbing at areas thereof reinforced by said elements to form transverse seal sections each having a sharp bend overlapped by one of said elements.

2. In the art of making containers, the method which comprises applying pairs of reenforcing elements to a web of pliant material at intervals of extents longitudinally of the web corresponding with the lengths of the containers, joining the edges of the web to form a tube, and flattening the tube to form transverse seal sections each of whose ends is embraced by an element of one of said pairs.

3. In the art of making containers, the method which comprises applying at intervals along a web reenforcing elements each extending substantially across the web, joining the edges of the web to form a tube with said elements forming bands spaced longitudinally thereof, and applying heat and pressure transversely of the tube to form transverse seals each overlapped by one of said bands.

4. In the art of making containers, the method which comprises applying to a web reenforcing elements spaced from each other trans-

5/91.

versely and longitudinally of the web, joining the edges of the web to form a tube, and applying heat and pressure transversely of the tube to form flattened seals each of whose ends is overlapped by one of said elements.

5. In the art of making containers, the method which comprises feeding a web toward a tubular form, at a station in advance of said form applying to said web at intervals along it, reenforcing elements each extending substantially across the web, shaping the web about said form and joining its edges to form a tube having bands, respectively formed by said elements, spaced longitudinally thereof, and applying heat and pressure to said tube to form seals each overlapped by one of said bands.

6. In the art of making containers, the method which comprises feeding a web toward a tubular form, at a station in advance of said form, applying to said web at intervals longitudinally thereof, pairs of reenforcing elements spaced transversely of the web, shaping the web about said web and joining its edges to form a tube, and applying heat and pressure to said tube to form seals each of whose ends is overlapped by one of said elements.

7. The method of making reenforced containers and filling them which comprises applying reenforcing elements at intervals longitudinally of a web, joining the edges of the web to form a tube, applying heat and pressure to the tube to form seals each including at least one sharp fold of which is overlapped by one of said elements, introducing filling into the tube between formation of successive seals, and cutting the tube transversely through said seals and said elements to form individual filled containers each reenforced by overlap at and adjacent said seals.

8. The method of making reenforced containers and filling them which comprises applying at intervals along a web reenforcing elements each extending substantially across the web, joining the edges of the web to form a tube with said elements forming bands spaced longitudinally thereof, applying heat and pressure intermediate the edges of said bands to form seals extending across the tube, introducing filling into the tube between formation of successive seals, and cutting the tube transversely through said seals and between said edges of said bands to form individual filled containers each reenforced at and adjacent said seals by overlap thereof by said bands.

9. The method of making reenforced containers and filling them which comprises applying at intervals along a web pairs of reenforcing elements spaced transversely of the web, joining the edges of the web to form a tube, applying heat and pressure to the tube to form seals each overlapped at its ends by one of said pairs of elements, introducing filling into the tube between formation of successive seals, and cutting the tube through said seals to form individual filled containers each of whose sealed corners is individually reenforced.

10. In the art of making reenforced containers, the method which comprises intermittently feeding a web toward a tubular form, between successive feeding movements of the web applying reenforcing elements thereto at intervals longitudinally thereof, shaping the web about said form and joining its edges to form a tube, and beyond said form applying heat and pressure transversely of the tube at areas reinforced by said elements to form seal sections each overlapped by at least one of said elements.

11. In the art of making containers, the method which comprises applying reenforcing elements intermediate the edges of a web in spaced relation to each other longitudinally of and transversely of the web, joining said edges to each other to form a tube, and applying heat and pressure transversely of the tube to form seal sections spaced longitudinally of the tube and each overlapped by at least one of said elements.

12. In the art of making containers, the method which comprises applying reenforcing elements at intervals longitudinally of a web, joining the edges of the web to form a tube, transversely flattening the tube at intervals longitudinally thereof to fold the web within areas reinforced by said elements, and applying heat and pressure to the flattened portions of the tube to form seals.

JOHN S. STOKES.

5/12

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,260,064

METHOD OF MAKING CONTAINER

Filed Aug 16 193[illegible] [illegible]ets-Sheet 1

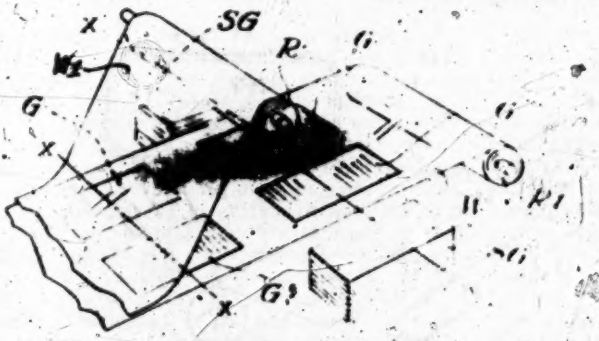

Fig. 2.

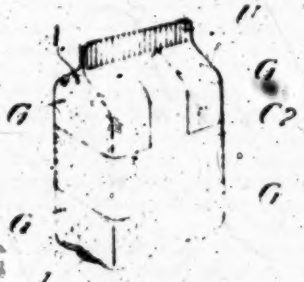

Fig. 3.

Fig. 1.

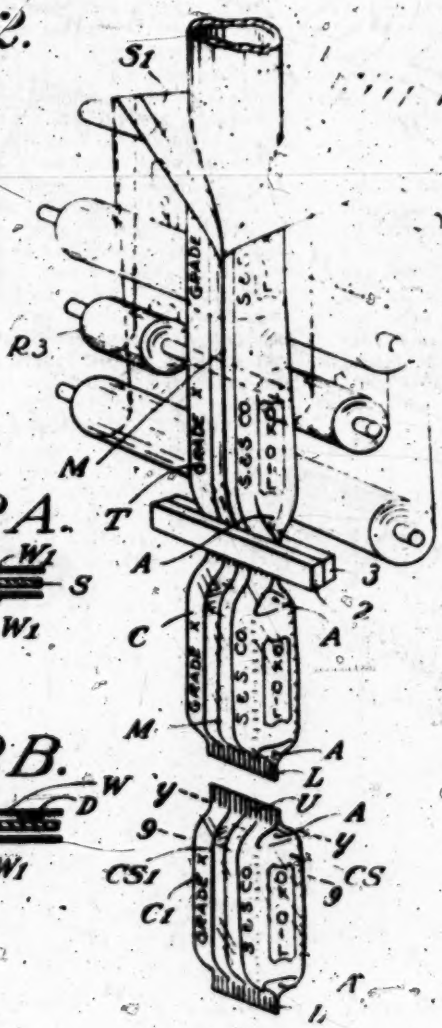

Fig. 2A.

Fig. 2B.

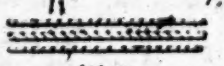

Fig. 2A.

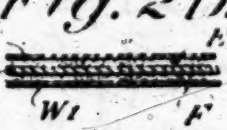

Fig. 2D.

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5/107

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,260,064

METHOD OF MAKING CONTAINERS

Filed Aug. 16, 1939 4 Sheets-Sheet 2

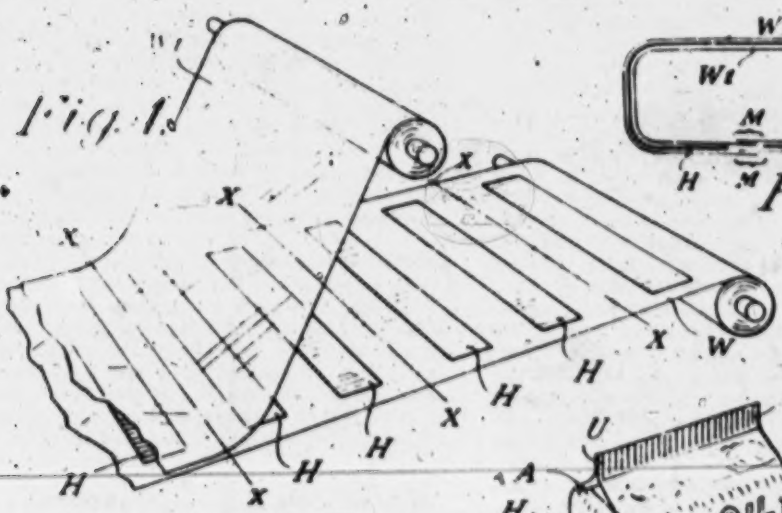

Fig. 1.

Fig. 6.

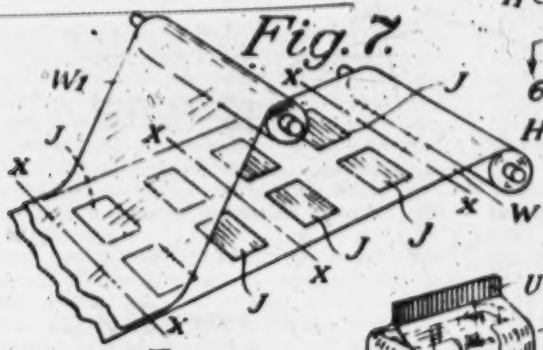

Fig. 7.

Fig. 5.

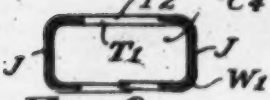

Fig. 9.

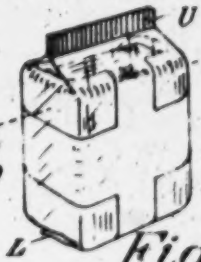

Fig. 8.

Fig. 11.

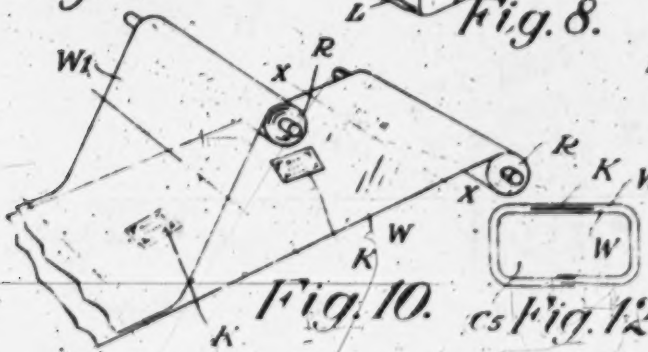

Fig. 10.

C5 Fig. 12.

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5/108

Plaintiff's Exhibit 5

Oct. 21, 1941. J. S. STOKES 2,260,064

METHOD OF MAKING CONTAINERS

Filed Aug. 16, 1939 4 Sheets-Sheet 3

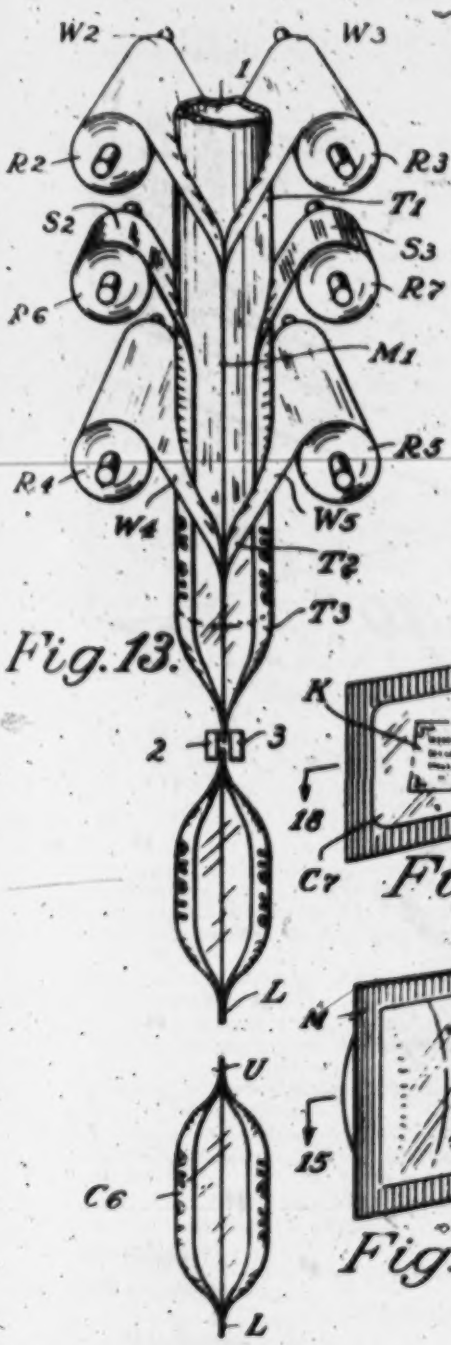

Fig. 13.

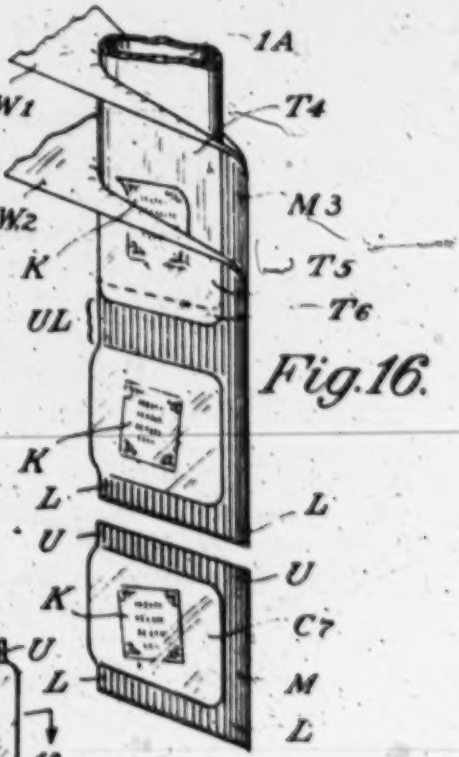

Fig. 16.

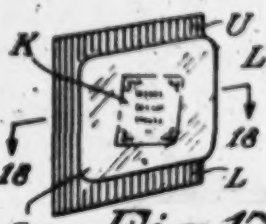

Fig. 17.

Fig. 18.

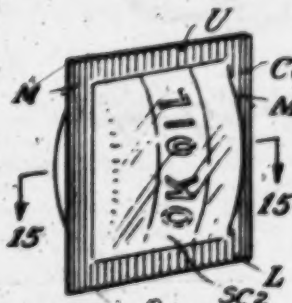

Fig. 14.

Fig. 15.

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5/109

Plaintiff's Exhibit 5.

Oct. 21, 1941. J. S. STOKES 2,260,064

METHOD OF MAKING CONTAINERS

Filed Aug. 16, 1939 4 Sheets-Sheet 4

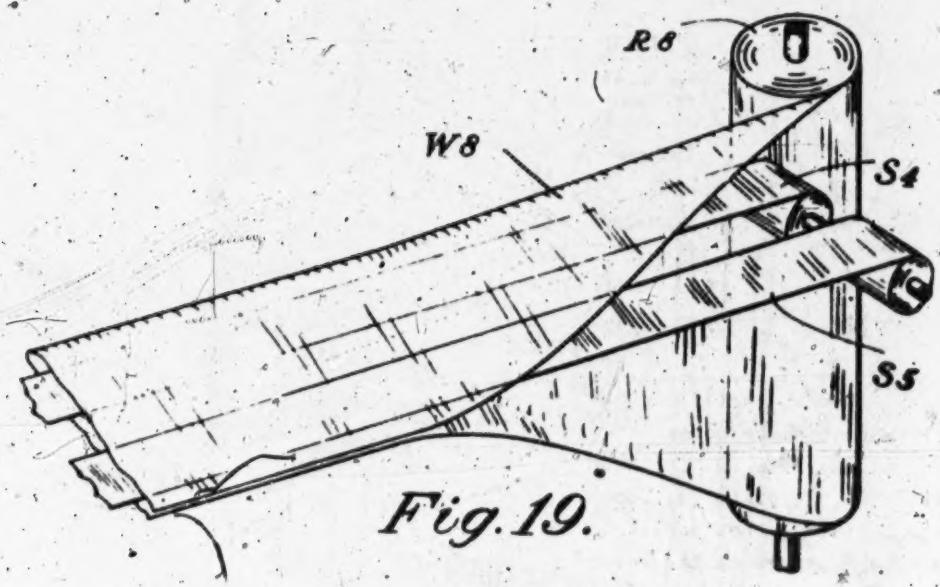

Fig. 19.

Fig. 20.

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5/111

Plaintiff's Exhibit 5

Patented Oct. 21, 1941 2,260,064

UNITED STATES PATENT OFFICE

2,260,064

METHOD OF MAKING CONTAINERS

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Application August 16, 1939, Serial No. 290,378

23 Claims. (Cl. 93—3)

My invention relates to the manufacture of [illegible] containers for liquid and other ma-

Fig. 10 illustrates formation of another type of multi-ply webbing;

CERTIFICATE OF CORRECTION.

Patent No. 2,260,064. October 21, 1941.

JOHN S. STOKES.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 52, for "repated" read --repeated--; page 7, second column, line 38, claim 23, for the word "step" read --steps--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of November, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

the container walls.

My invention further resides in the methods of making containers hereinafter described and claimed.

For illustration of various forms of containers made in accordance with my invention, and of preferred methods of making them, reference is to be had to the accompanying drawings in which:

Fig. 1 in perspective illustrates the formation of filled containers from webbing;

Fig. 2 in perspective illustrates the formation of multi-ply webbing suited for making another type of container;

Figs. 2A, 2B, 2C and 2D are sectional views of multi-ply webbing referred to in explanation of Fig. 2 and other figures;

Fig. 3 in perspective shows a filled container made from the webbing of Fig. 2;

Fig. 4 in perspective illustrates the formation of another type of multi-ply webbing;

Fig. 5 in perspective shows a container made from the webbing of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 in perspective shows the formation of another type of multi-ply webbing;

Fig. 8 in perspective shows a filled container made from the webbing of Fig. 7;

Fig. 9 is a section taken on line 9—9 of Fig. 8;

joined to form a multi-ply tube T; preferably, the webs W, W1 are of Cellophane, Pliofilm, or other web material which is thermoplastic because coated, impregnated with, or consisting of thermoplastic material; when the webs are of such material, the joinder of their overlapping margins is effected by application of heat and pressure effected, for example, by a heated roll or platen which presses the overlapping margins of the webs against the form f.

Below the end of the form f, the multi-ply tube T is flattened and transversely sealed by the heated clamping tools 2, 3, to close the bottom of a container next to be filled and to seal the top of a previously formed and filled container C. The tools 2 and 3, while clamping the web between them, are moved downwardly to feed additional web material from the rolls R, R1 over the form f where their edges are joined to form a further section of tubing T with longitudinal seam M. When the tools 2, 3 are released and again moved to the clamping position shown in Fig. 1, there is sealed the upper end of another container which, between the successive clamping movements of the tools 2, 3, was filled by introduction of material through the hollow form f. Thus, by repeated clamping movements of the tools 2, 3, and their downward movement, there is formed a succession of filled containers, machines suitable to perform afore-

5,198

Plaintiff's Exhibit 5

Patented Oct. 21, 1941

2,260,064

UNITED STATES PATENT OFFICE

2,260,064

METHOD OF MAKING CONTAINERS

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Application August 16, 1939, Serial No. 290,378

25 Claims. (Cl. 93—3)

My invention relates to the manufacture of multi-ply containers for liquids and other materials, from flexible webs, particularly Cellophane, Pliofilm, or the like.

In accordance with my invention, web material is shaped and its marginal edges joined to form a multi-ply tube having within its multi-ply wall material introduced between the plies of web material before or after it is shaped to form the tube; more particularly, in accordance with certain aspects of my invention, web material is shaped and its marginal edges joined to form a multi-ply tube of at least two nested tubes, with at least two plies either entirely or substantially wholly free of attachment to each other to provide inter-ply accommodation for material, usually in sheet form and comprised of a succession of individual elements, or of one or more continuous strips, retained between the plies of containers formed by transversely sealing the multi-ply tube at intervals longitudinally thereof; the strips or elements, when the overlying ply or plies are of transparent material, may be used for display purposes in addition or alternatively to their use as reenforcement for the container walls.

My invention further resides in the methods of making containers hereinafter described and claimed.

For illustration of various forms of containers made in accordance with my invention, and of preferred methods of making them, reference is to be had to the accompanying drawings in which:

Fig. 1 in perspective illustrates the formation of filled containers from webbing;

Fig. 2 in perspective illustrates the formation of multi-ply webbing suited for making another type of container;

Figs. 2A, 2B, 2C and 2D are sectional views of multi-ply webbing referred to in explanation of Fig. 2 and other figures;

Fig. 3 in perspective shows a filled container made from the webbing of Fig. 2;

Fig. 4 in perspective illustrates the formation of another type of multi-ply webbing;

Fig. 5 in perspective shows a container made from the webbing of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 in perspective shows the formation of another type of multi-ply webbing;

Fig. 8 in perspective shows a filled container made from the webbing of Fig. 7;

Fig. 9 is a section taken on line 9—9 of Fig. 8;

Fig. 10 illustrates formation of another type of multi-ply webbing;

Fig. 11 shows a container made from the webbing of Fig. 10;

Fig. 12 is a section taken on line 12—12 of Fig. 11;

Fig. 13 in perspective illustrates the formation of a wafer type of container from webbing;

Fig. 14 in perspective shows a container made by the method of Fig. 13;

Fig. 15 is a section taken on the line 15—15 of Fig. 14;

Fig. 16 illustrates formation of another type of wafer-shape container;

Fig. 17 in perspective shows a container made by the method of Fig. 16;

Fig. 18 is a section taken on line 18—18 of Fig. 17;

Fig. 19 in perspective illustrates formation of another type of multi-ply web;

Fig. 20 is a section of a container made from the webbing of Fig. 19.

Referring to Fig. 1, the webs W, W1 removed, respectively, from the rolls R, R1 are shaped about the hollow form *f* and their marginal edges joined to form a multi-ply tube T; preferably, the webs W, W1 are of Cellophane, Pliofilm, or other web material which is thermoplastic because coated, impregnated with, or consisting of thermoplastic material; when the webs are of such material, the joinder of their overlapping margins is effected by application of heat and pressure effected, for example, by a heated roll or platen which presses the overlapping margins of the webs against the form *f*.

Below the end of the form *f*, the multi-ply tube T is flattened and transversely sealed by the heated clamping tools 2, 3, to close the bottom of a container next to be filled and to seal the top of a previously formed and filled container C. The tools 2 and 3, while clamping the web between them, are moved downwardly to feed additional web material from the rolls R, R1 over the form *f* where their edges are joined to form a further section of tubing T with longitudinal seam M. When the tools 2, 3 are released and again moved to the clamping position shown in Fig. 1, there is sealed the upper end of another container which, between the successive clamping movements of the tools 2, 3, was filled by introduction of material through the hollow form *f*. Thus, by repeated clamping movements of the tools 2, 3, and their downward movement, there is formed a succession of filled containers; machines suitable to perform afore-

said steps are shown in Zwoyer Patent No. 1,966,422, Sonneborn et al. application Serial No. 269,748, filed March 4, 1939; and Maxfield application Serial No. 205,937, filed May 4, 1938 upon which applications have issued Letters Patents of the United States Nos. 2,200,971 and 2,199,708, respectively.

To produce the "square" type container shown in Fig. 1 and other figures, the opposite sides of tube T are tucked in before the tube is flattened by sealing tools 2, 3, thus to form the gusset folds A. A suitable mechanism for effecting this tucking operation is described and claimed in Sonneborn et al. application Serial No. 297,484, filed October 2, 1939.

In accordance with the present invention, the container is formed from multi-ply webbing shaped and marginally joined to comprise nested tubes which are substantially free of attachment to each other except at the transverse seals formed by the tools 2, 3, or equivalent, defining the ends of the containers. The inner and outer tubes, depending upon the method of sealing, may be attached to each other by joinder of their marginal seals or may be entirely free of attachment except at the transverse seals.

The space between these two tubes is utilized, in the modification shown in Fig. 1, to receive the strips S, S1 fed from the rolls R2, R3, between the webs W, W1 as they pass toward the form 1.

The strips S, S1, so introduced between the nested tubes forming the multi-ply tube T, may serve as reenforcements for the webs W, W1; the strips S, S1 may be of the same material as the webs W1, W2 or of different material; they may, for example, be paper, fabric, metal foil, or other sheet material. When the web W1 is of transparent material, such as Cellophane or Pliofilm, either or both of the strips S, S1 may be decorated or printed for display purposes to avoid need for use of expensive printed Cellophane, Pliofilm, or like material.

For forming filled containers, each of the transverse seal sections formed by the tools 2, 3 between the successive containers is severed transversely intermediate its horizontal edges so that the lower part of it forms the seal U for the upper end of one container and the upper part of the same seal section forms the seal L for the lower end of the next container. When, however, it is desired to make open-end containers subsequently to be filled, each transverse seal section is cut along one edge, for example y—y, instead of intermediate its edges. In either case, when the multi-ply tube T is severed to detach an individual container, the reenforcing strips S, S1 are concurrently cut to leave within the multi-ply wall of the container the two elements CS, CS1 cut from the strips S, S1, respectively.

Particularly when the multi-ply containers are filled and sealed at both ends, the elements CS, CS1, within each container, may be free of attachment to either the inner or outer ply and may be held in place within the multi-ply wall by the clamping effect of the end seals and by fine adhesion at the end seals between S, S1, W and W1; or when the strips S, S1 are of thermoplastic material, they may be free of attachment within the multi-ply wall except where they may be joined to the inner and outer tubes or webs by the sealing action of the tools 2, 3.

While the sole or principal purpose of strips CS, CS1 is to reenforce the webs W, W1, it is preferable they be left free, as above described, within the multi-ply wall, Fig. 2A, that the container may more readily conform to a shape induced by pressure without undue distortion, and so be less apt to break or crack at its corners or edges; moreover, movement of the strips within the plies reduces the possibility of coincidence of weakened areas of the plies and strips.

However, as shown in Fig. 2B, the strip S or S1 may be attached at small spaced areas, indicated generally by the dabs D of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2C, the strip S or S1 may be attached throughout one face thereof, as indicated by the coating E of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2D, both faces of strip S or S1 may be, throughout, attached to both webs W and W1, generally as indicated by adhesive coatings E, F. It is to be understood that the dotted areas D, E, F represent attachment by adhesive, or attachment by heat-sealing of thermo-plastic materials.

The number of strips introduced between the webs W, W1, Fig. 1, may be smaller or greater than two; however, when the webs W, W1 are of transparent material, the total width of the strip or strips introduced between the webs is, particularly if the strip or strips are opaque, less than the circumference of the completed containers, thus to provide for inspection of the container contents through transparent wall structure of the container beyond the interwall strip.

When the outer web W1 is of transparent film, such as Cellophane, Pliofilm, or the like, the finish of the paper strips S, S1 need not be of high grade because the sheen of the film insures smooth, pleasing appearance of the containers; the covering of strips S, S1 by the transparent film W1 also preserves the legibility of the printing on the container because the film, compared with the paper strips, has negligible tendency to absorb grease, oil, or the like, during handling of the containers.

In the modification shown in Fig. 2, the webbing again comprises two webs W, W1 fed from supply rolls R, R1 toward a form 1, such as shown in Fig. 1. While the webs are moving or at rest in their path from the supply rolls R, R1 to the form 1, there is introduced between them a series of groups of elements G which are spaced from each other transversely and longitudinally of the web; preferably, the longitudinal spacing between the elements G is materially less than the distance between lines x—x, corresponding with the length of web required for one container.

Consequently, when the composite web W, W1, G, is shaped around the form 1, there is produced a multi-ply tube T within whose multi-ply wall there are two series of longitudinally spaced elements G; the sealing tools 2, 3 flatten the multi-ply tube and seal it transversely across each pair of elements G, and subsequently knife structure, not shown, severs the multi-ply tube transversely within the limits of each seal section, thus to form a series of filled containers similar to that shown in Fig. 3.

Assuming the elements G are of thermoplastic material, each of them, in the package C2 shown in Fig. 3, is in part thermoplastically bonded into one end of one of the seals U or L, and the major or remaining part of each element G may be free of attachment to either of the inner or outer

5/100

plies of the package. Each of the elements G overlies and reenforces that part of the package which is most susceptible to breakage; namely, the corners and edges and particularly the sharp bends within the gusset folds A at the corners of the container.

The elements G may be fed from stacks SG thereof, Fig. 2, or may be cut from strips and fed in successive groups between the webs W, W1.

To preclude possibility of displacement of the elements G after engagement with one or both of the webs W, and until they are held in place as by the sealing performed by the tools 2, 3, they may be attached to web W, for example, at one or more small areas; when the elements G and web W are of thermoplastic material, this may be effected by stencilled adhesive applied in advance of the region of engagement between the webs W, W1.

Though superficially resembling the type of container shown and described in my copending application Serial No. 277,132, filed June 3, 1939, the container C2, Fig. 3, is an improvement both from standpoint of appearance and strength; because the reenforcing elements G are not attached to both and preferably neither of the plies, there is greatly decreased tendency for the material of the container wall to be weakened by repeated flexure at any definite place.

Preferably, as shown, the total area of the elements G is less than that of the container C2, so that when the webs W, W1 of the multi-ply wall are transparent, the contents are visible from the exterior of the container through its wall beyond the reenforcing elements which are usually, though not necessarily, opaque.

In the modification of Fig. 4, while the webs W, W1 are en route to the tube 1 about which they are shaped, and their marginal edges joined to form a multi-ply tube, there is disposed between them a series of longitudinally spaced elements H having, in general, the purpose and function of the strips S, S1 of Fig. 1 and the elements G of Fig. 2. Each pair of elements H, H is so spaced longitudinally of the web that the distance between their remote edges measured longitudinally of the web is less than the length of web material, between lines x—x, required to make a container. The elements H may be entirely free of attachment to either or both of the webs W, W1 or each of them may be attached, at least in one or two small areas, to at least one of the webs, to prevent their displacement during formation of the containers.

As the composite webbing, comprising the webs W, W1, and reenforcing elements H, is shaped about the form 1, there is produced a multi-ply tube whose inner and outer plies are unattached except at the transverse seals formed by the tools 2, 3 and perhaps additionally at the longitudinal seals M, dependent upon the manner in which they are formed. In any event, each container formed from the webbing of Fig. 4 comprises intermediate its ends, as shown in Fig. 5, two bands H lying within its multi-ply wall and substantially encircling it (Fig. 6). These bands may serve simply to reenforce the package C3, or additionally or alternatively, they may be used for decorative or display purposes when at least the outer web W1 is of transparent material such as Cellophane or Pliofilm. When both webs W, W1 are of transparent material, the contents of the container C3 are visible between the two encircling elements H, H.

When used for reenforcing purposes, the width of the elements H should be such that they overlie the corners of the package C3 and reenforce the sharp bends within the gusset folds A at its corners; because the reenforcing elements H, H are substantially free of attachment to each of the plies or tubes, there is absent the stiffening or embrittling effect of adhesive which would stiffen the wall and make it more susceptible to breakage; furthermore, because the elements H are free of attachment to the inner and outer plies, the possibility of relative movement lessens the tendency for the wall locally to weaken at any definite place.

Referring to Fig. 7, while the webs W, W1 are moving or at rest on their way toward the form 1, Fig. 1, there is introduced between them a series of groups of elements J; each group comprises four elements spaced from each other transversely and longitudinally of the web. The distance between the remote edges of each pair of elements J, J, measured longitudinally of the web, is less than the distance, between the lines x—x, corresponding with the length of webbing required for a container. The elements J may be free of any attachment to the webs, or they may be attached in part or in whole to either or both of the webs, generally as shown in Figs. 2B-D. Preferably, they are substantially entirely free of any attachment.

The shaping of the webbing and joinder of its marginal edges about the form 1 results in a multi-ply tube between whose inner and outer walls there are included a series of groups of elements J; the sealing tools 2, 3 flatten the multi-ply tubing transversely at intervals to define a series of containers C4, Fig. 8, each having within its multi-ply wall and between its ends four reenforcing elements J, each embracing and reenforcing one corner of the finished container. When at least the outer ply is transparent, any one or more of the elements J may have thereon decoration or printing visible from the exterior of the package and whose visibility is preserved by the overlying and protective web W1.

In this package, like package C3, Fig. 5, the reenforcing elements terminate short of the end seals to afford increased stability of the package when the lower seal is turned under to square the bottom.

It is quite common to include premium slips, coupons, souvenirs, and the like, in packages of solid materials, but, for obvious reasons, it has not been feasible to do so with liquids. In the modification of my invention shown in Figs. 10 to 12, the space within the multi-ply wall of the containers is utilized to hold such souvenir, coupon, or the like, regardless of whether the contents of the container be liquid or solid.

Referring to Fig. 10, before the webs W, W1 are shaped about the tube 1, Fig. 1, there is introduced between them a series of elements K generically representative of a souvenir, premium coupon, advertising pamphlet, or the like at intervals each substantially equal to the length of webbing required for a container. Consequently, when the edges of the webbing are joined to form a multi-ply tube, there is within the multi-ply wall of the tube a series of elements K which are isolated from one another when the multi-ply tube is flattened by the sealing tools 2, 3 to form a series of containers each having within its multi-ply wall one of aforesaid elements K. Because the position of element K within its container is ordinarily of no significance, so long as there be one per package, it

may not be necessary to attach the elements K to either web. Fig. 10.

Referring to Fig. 13, the marginal edges of the webs W2, W3 removed, respectively, from the rolls R2, R3, are joined to form a tube T1 from which extend on the opposite sides thereof two seams M1; a similar tube T2 overlying tube T1 is formed by joining the marginal edges of the webs W4, W5 fed from the rolls R4, R5 to seams M1. Between the two nested tubes T1, T2, there are fed the strips S2, S3 removed from the rolls R6, R7. Below the end of the form 1, about which the webs are shaped, the multi-ply tube T3 comprising tubes T1, T2 is flattened at intervals longitudinally thereof by the sealing tools 2, 3, generally as described in connection with Fig. 1, to form a series of containers joined by a seal section UL which is transversely cut to form individual containers. Two sides of each container C6, Figs. 13 to 15, are sealed by the longitudinal seals M1, of the multi-ply tube T3 and the other two sides are closed by the upper and lower seals U, L formed as above described. At the same time each container is detached by cutting through one of the transverse seals, the strips S2, S3 within the multi-ply wall of the container are also cut so that each container has within its wall two strips or bands SC2, SC3, one on each side of the package and extending the length thereof.

The strips S2, S3 may be of any of the materials mentioned above in discussion of preceding modifications as suitable for the strips S, S1, Fig. 1, or the elements H, Fig. 4, or J, Fig. 7, and the webs W2—W5, which may be all of the same or of different materials, may each be of any of the materials mentioned previously as suitable for the webs W1, W2 of the preceding modifications. If the reenforcing strips or elements are not of thermoplastic material, the webbing of the transverse seals will have some adhesion to the reenforcement but not as much as if the reenforcing strips were also thermoplastic.

Preferably, all four webs W2—W5 may be of transparent film, such as Cellophane or Pliofilm, which is thermoplastic; in which event, the marginal edges of the webs are joined to form the inner and outer tubes T1, T2 by application of heat and pressure exerted, for example, by pairs of rolls between which the edges of the webs pass as they are fed downwardly over tube 1 by the sealing tools 2, 3.

The strips S2, S3, in this modification of my invention, are used principally for decorative or display purposes and to avoid need for use of expensive printed Cellophane or Pliofilm.

Another type of wafer package using but two webs is shown in Figs. 16 to 18; the web W1 is shaped about the form 1A and its edges joined to form a tube T4 along one edge of which projects seam M3; over this inner tube is formed, from a second web W2, an outer tube T5. The edges of web W2 are joined to the seam M3 of the inner tube. When the webs are of thermoplastic material, such as Cellophane or Pliofilm, the joinder of the margins of the webs to form the multi-ply tube is effected by application of heat and pressure. Between the inner and outer tubes T4, T5 is introduced a premium coupon, tax stamp, advertising label or the like, generically represented by the element K.

The multi-ply tube T5 so formed is sealed transversely at intervals by sealing tools 2, 3, such as described in connection with Figs. 1 and 13, thus to form a series of containers each joined by wide seal sections UL each of which is subsequently cut transversely of the multi-ply tube to detach a finished container, the lower and upper parts of each seal section forming, respectively, the upper seal U of one container and the lower seal L for the next container above it.

In the modifications thus far described, two or more webs are utilized to form a multi-ply tube, but if desired a single web may be utilized, as shown in Fig. 19. The web W8, of width somewhat greater than twice the circumference of the containers to be formed, is fed from a roll R8 and folded to produce a two-layer web which, when shaped about a form, such as form 1 of Fig. 1, and its edges joined, forms a multi-ply tube T7, Fig. 20. Between the two plies of the webbing, or between the inner and outer tubes formed from it, there may be introduced the strips S4, S5 of paper, fabric, foil, or other material mentioned as suitable for the strips S—S4 of Figs. 1 and 13, or for the elements G, H and J of Figs. 2, 4 and 7; or, if desired, between the two layers formed by folding of web W8 may be introduced a succession of elements or groups of elements generally as shown in Figs. 2, 4 or 7.

The web W8 may be, and preferably is, of Cellophane or Pliofilm to provide for visibility of the contents of the containers formed from it and of printing or decorative matter upon the strips or elements introduced between the plies of the webbing from which the container is formed. The containers formed from web W8 and strip S4, S5, are in appearance similar to C1, Fig. 1.

In any of the modifications above described, there may be introduced between the nested tubes a conditioning agent or agents serving to maintain or enhance the strength of the container walls; for example, steam or moisture may be introduced between the webs, particularly when of Cellophane, to prevent embrittlement. Another suitable conditioning agent is glycerine which is preferably introduced by incorporating it in the adhesive used, generally as shown in Figs. 2B—D, to attach a reenforcing strip or element within the multi-ply wall of the container; in like manner, moisture may be introduced within the multi-ply wall of the containers by its incorporation in the adhesive used to attach a reenforcing element or strip to one or both of the plies.

In any of the modifications, the number of plies in the container wall may be increased by using additional webbing and shaping it to form one or more additional tubes nesting with those illustrated.

In any of the modifications herein described, after introduction between them of one or more strips such as S—S5, or of elements G—K, the webs, before or after they are shaped into tubing, may be joined to each other throughout and to the introduced strips or elements in any known manner suited to the materials comprising the webbing and the interposed strip or elements.

What I claim is:

1. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to one another, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing filling into each of the containers between the aforesaid transverse sealing operations defining it, transversely

5/102

severing the multi-ply tube to detach the sealed and filled containers therefrom in succession, and in advance of the detachment of each filled and sealed container introducing between the web material forming said nested tubes sheet material which is retained within the multi-ply wall of that container.

2. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said two tubes a succession of elements of sheet material spaced longitudinally of said multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers each having at least one of said elements within its multi-ply wall, introducing filling into each of the containers in the interval between the successive aforesaid transverse sealing operations defining it, and severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having between plies of its multi-ply wall at least one of said elements of sheet material.

3. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said two tubes a succession of elements of sheet material spaced longitudinally of said multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid transverse sealing operations defining it, and transversely severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having at least two of said elements within its multi-ply wall and spaced from each other longitudinally thereof.

4. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes a succession of elements of sheet material spaced longitudinally of said multi-ply tube and each of length substantially corresponding with the periphery of said tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a series of multi-ply containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and transversely severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having peripherally extending within its multi-ply wall at least one of said elements.

5. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes a succession of reinforcing elements of sheet material spaced from each other longitudinally of said multi-ply tube and each of length substantially corresponding with the periphery of said tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a series of multi-ply containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and transversely severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having within its multi-ply wall two of said spaced elements extending peripherally of and reenforcing the ends of the container.

6. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes elements of sheet material spaced peripherally thereof, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having extending longitudinally within its multi-ply wall at least two of said peripherally spaced elements.

7. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes reinforcing elements of sheet material spaced longitudinally and peripherally thereof, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a series of multi-ply containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having its corners reenforced by a group of said elements within its multi-ply wall.

8. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes a succession of elements of sheet material spaced longitudinally of said multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof between successive elements to define a succession of containers, introducing filling into each of the containers in the interval between the successive aforesaid transverse sealing operations defining it, and transversely severing the multi-ply tube between successive of said elements in succession to detach therefrom sealed and filled containers each sealed at both ends and having within its multi-ply wall at least one of said elements free of attachment to either of the seals at the ends of the container.

9. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material

5/103

Plaintiff's Exhibit 5

6

2,260,064

forming said nested tubes a succession of elements spaced longitudinally of said multi-ply [illegible] attachment thereto, transversely sealing the multi-ply tube at intervals longitudinally thereof between successive elements to define a succession of containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having confined within its multi-ply wall by the transverse seals at least one of said free elements.

19. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes at least one continuous web of sheet material, transversely sealing the multi-ply tube at intervals longitudinally thereof and of said container web to define a succession of multi-ply containers and to prevent displacement of said introduced web material within the multi-ply wall of each container, introducing filling into each of the containers in the interval between the successive aforesaid transverse sealing operations defining it, and concurrently transversely severing the multi-ply tube and the inter-ply web material to detach the filled and sealed containers each with at least one strip of said introduced web material extending the length thereof within the multi-ply wall.

11. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, introducing between the web material forming said nested tubes a succession of reinforcing elements of sheet material spaced from each other longitudinally of said multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a series of multi-ply containers and to fix the positions of said elements within the multi-ply walls of said containers for reinforcement at and adjacent the transverse seals, introducing filling into each of the containers in the interval between the successive aforesaid transverse sealing operations defining it, and transversely severing the multi-ply tube in succession to detach therefrom sealed filled containers each locally internally reinforced at and adjacent its sealed ends by said web material introduced between the plies.

12. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, attaching to at least the web material forming one of said nested tubes for introduction between them a succession of elements of sheet material spaced from each other longitudinally thereof, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the aforesaid transverse sealing operations defining it, and severing the multi-ply tube in succession to detach therefrom sealed and filled containers each having at least one of said elements attached thereto within its multi-ply wall.

13. In the art of making containers, the method which comprises joining the marginal edges of at least two webs to form a multi-ply tube of two nested tubes which are substantially free of attachment to each other, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, transversely severing the multi-ply tube to detach therefrom sealed, filled containers, and in advance of the detachment of each filled, sealed container introducing between the web material forming said nested tubes reinforcing material which is retained within the multi-ply wall of each container.

14. In the art of making containers, the method which comprises joining the marginal edges of at least two webs to form a multi-ply tube of two nested tubes substantially free of attachment to each other, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing filling into each of the containers in the intervals between the successive aforesaid sealing operations defining it, transversely severing the multi-ply tube to detach therefrom sealed, filled containers, and in advance of the detachment of each filled, sealed container introducing between the web material forming said nested tubes web-reinforcing material which is retained within the multi-ply wall of each container only by the transverse seals.

15. In the art of making containers, the method which comprises joining the marginal edges of at least two webs to form a multi-ply tube of two nested tubes substantially free of attachment to each other, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, transversely severing the multi-ply tube to detach sealed, filled containers therefrom, and in advance of the detachment of each filled, sealed container introducing between the web material forming said nested tubes sheet material retained within the multi-ply wall of each container.

16. In the art of making containers, the method which comprises shaping transparent web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes to substantial extent free of attachment to each other, introducing between the web material forming said nested tubes sheet material which is at least in part opaque, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, and transversely severing the multi-ply tube to detach sealed, filled containers therefrom each having within its multi-ply wall said opaque material visible from the exterior of the container through at least one of said plies and isolated from the filling in the container by at least another of said plies.

17. In the art of making containers, the method which comprises shaping transparent web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which to substantial extent are free of attachment to each other, introducing between

5/104

the web material forming said nested tubes a succession of individual elements of sheet material spaced longitudinally of said multi-ply tube and at least in part opaque, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, and transversely severing the multi-ply tube to detach therefrom sealed, filled containers each having within its multi-ply wall, visible from its exterior through at least one of said plies and separated from the filling within the container by at least another of said plies, at least one of said elements of sheet material.

18. In the art of making containers, the method which comprises shaping transparent web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which to substantial extent are free of attachment to each other, introducing between the web material forming said two tubes at least one continuous strip of sheet material at least in part opaque, transversely sealing the multi-ply tube at intervals longitudinally thereof and of said strip to define a succession of multi-ply containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, and concurrently transversely severing said strip and the multi-ply tube to detach sealed, filled containers, each having visible from its exterior through at least one of said plies and separated from its filling by at least another of said plies, the strip introduced within its multi-ply wall.

19. In the art of making containers, the method which comprises joining the marginal edges of at least two webs, at least one of which is transparent, to form a multi-ply tube of two nested tubes substantially free of attachment to each other, introducing between the webbing forming said nested tubes sheet material which is at least in part opaque, transversely sealing the multi-ply tube at intervals to define a series of containers, introducing filling into each of the containers in the interval between the successive aforesaid sealing operations defining it, and transversely severing the multi-ply tube to detach sealed, filled containers each having within its multi-ply wall said opaque material visible from the exterior of the container through the transparent webbing forming at least one of said plies and separated from the filling in the container by at least another of said plies.

20. In the art of making containers, the method which comprises shaping thermoplastic web material and applying heat and pressure to its marginal edges to form a multi-ply tube of two nested tubes substantially free of attachment to each other, introducing between the web material forming said nested tubes a succession of reinforcing elements of sheet material spaced from each other longitudinally of said multi-ply tube, applying heat and pressure to said multi-ply tube at intervals longitudinally thereof to form seal sections defining a succession of multi-ply containers, introducing fillings into each of the containers in the interval between the aforesaid successive sealing operations defining it, and transversely severing the multi-ply tube to detach therefrom sealed, filled containers each having within its multi-ply walls one of said reinforcing elements within the multi-ply walls.

21. In the art of making containers, the method which comprises shaping web material and joining its marginal edges to form a multi-ply tube of at least two nested tubes which at least to substantial extent are free of attachment to each other, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, cutting the multi-ply tube transversely through the transverse seals to detach individual containers each sealed at both ends, introducing filling into the innermost tube between successive transverse sealing operations, and introducing between said nested tubes reinforcing material retained within the multi-ply wall of each individual filled container by the transverse seals at its ends.

22. In the art of making containers, the method which comprises feeding web material from one or more sources of supply thereof to a station at which it is severed, while the web material is en route to said station performing the steps of shaping the web material and joining its marginal edges to form a multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing reinforcing sheet material between the web material forming adjacent plies, introducing filling into the containers in the intervals between the transverse seals defining them, and at said station transversely severing the webbing to detach therefrom sealed, filled containers each having said reinforcing sheet material between plies of its multi-ply wall.

23. In the art of making containers, the method which comprises feeding web material from one or more sources of supply thereof to a station at which it is severed, while the web material is en route to said station performing the step of shaping the web material and joining its marginal edges to form a multi-ply tube at least whose outer ply is transparent, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, introducing between the material forming adjacent plies sheet material having thereon markings visible through said outer ply, introducing filling into the containers between the transverse seals defining them, and at said station transversely severing the multi-ply tube to detach therefrom filled, sealed containers each having said sheet material isolated from its filling by at least one inner ply and with said markings on the sheet material visible through said outer transparent ply.

24. In the art of making containers, the method which comprises feeding web material from one or more sources of supply thereof to a station at which it is severed, while the web material is en route to said station performing the steps of shaping the web material and joining its marginal edges to form a multi-ply tube, transversely sealing the multi-ply tube at intervals longitudinally thereof to define multi-ply containers, before said transverse sealing introducing between the web material forming adjacent plies at least one continuous strip of web material, introducing filling into the containers between the transverse seals defining them, and at said station concurrently severing the multi-ply tube and the introduced strip to detach sealed, filled containers each having at least one strip of introduced web material extending from one to the other of its sealed ends between plies of its multi-ply wall.

25. In the art of making containers, the method which comprises feeding web material

5/105

Plaintiff's Exhibit 5

from one or more sources thereof toward a station at which it is severed, while the web material is en route to said station performing the steps of shaping the web material and joining its marginal edges to form a multi-ply tube, introducing between the web material forming adjacent plies a succession of elements of sheet material spaced longitudinally of the web material, transversely sealing the multi-ply tube at intervals longitudinally thereof to define a series of multi-ply containers, introducing filling into the containers between the transverse seals defining them, and at said station transversely severing the multi-ply tube to detach therefrom sealed, filled containers each having within its multi-ply wall at least one of said elements of sheet material.

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5/106

Plaintiff's Exhibit 5

Aug. 25, 1942. J. R. SONNEBORN ET AL 2,294,215

APPARATUS FOR MAKING CONTAINERS

Filed Oct. 2, 1939 2 Sheets-Sheet 1

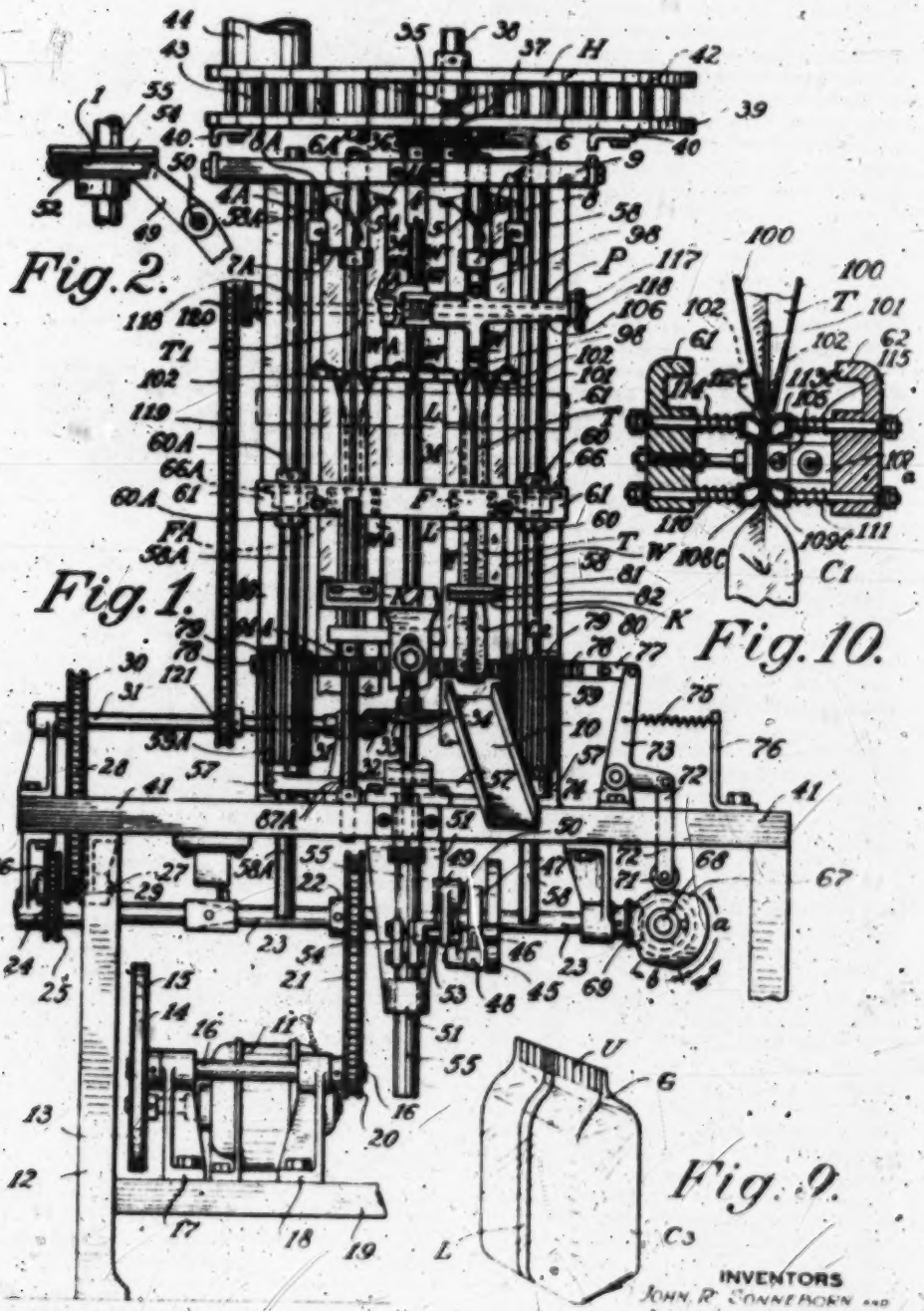

Fig. 2.

Fig. 1.

Fig. 10.

Fig. 9.

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5/117

Plaintiff's Exhibit 5

Aug. 25, 1942. J. R. SONNEBORN ET AL 2,294,215

APPARATUS FOR MAKING CONTAINERS

Filed Oct. 2, 1939 2 Sheets-Sheet 2

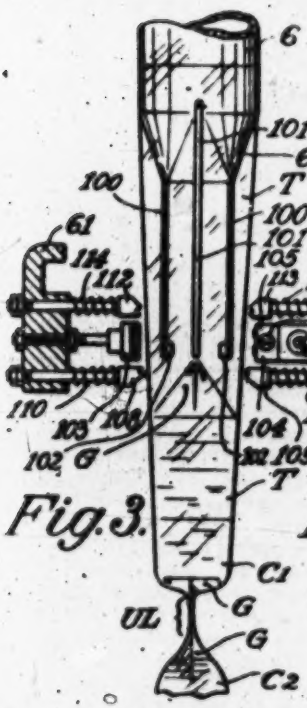


Fig. 3.

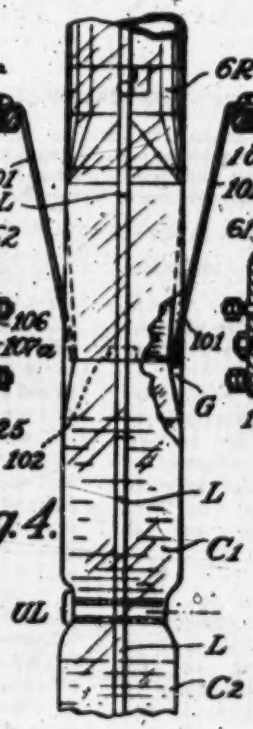


Fig. 4.

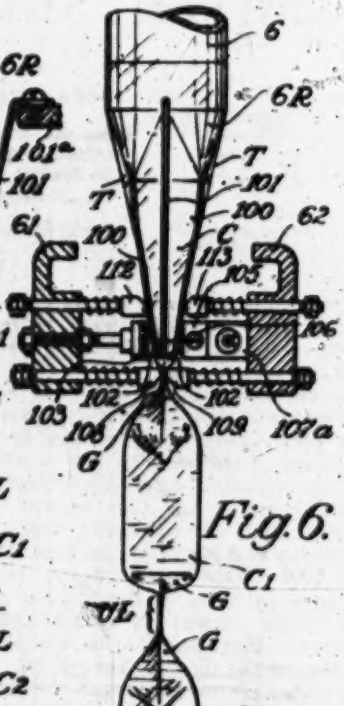


Fig. 6.

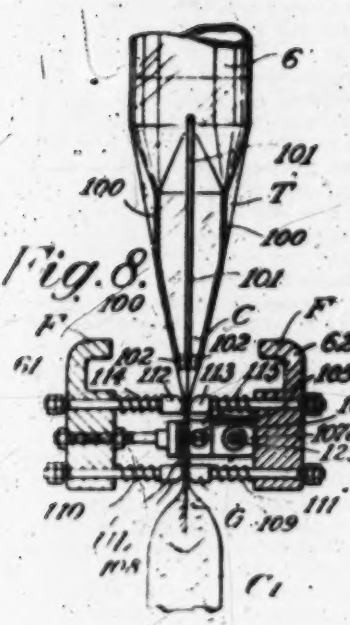
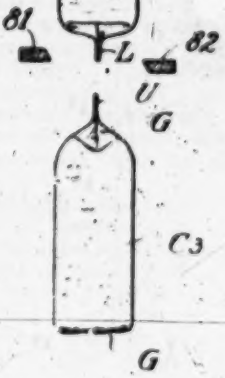


Fig. 8.

Fig. 5.

Fig. 7.



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5/118

Plaintiff's Exhibit 5

Patented Aug. 25, 1942

2,294,215

UNITED STATES PATENT OFFICE

2,294,215

APPARATUS FOR MAKING CONTAINERS

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Application October 2, 1939, Serial No. 297,481

17 Claims. (Cl. 93—18)

Our invention relates to apparatus for making containers from flexible material more particularly thermoplastic material such as Pliofilm, Cellophane, and the like.

In accordance with one aspect of our invention, webbing is shaped about a stationary form into a tube whose opposite sides are creased during feed of the webbing and are tucked in along the creasing substantially concurrently with flattening of the tube beyond the form to provide seals for containers which, because of aforesaid tucking in of the tube sides, have gusset folds within and adjacent their sealed ends; more particularly, the creasing and tucking in of the sides of the tube are effected by members which are biased to move between plates extending within the tube beyond the form, and which plates are moved toward one another by clamping or sealing members which flatten the tube as aforesaid.

In accordance with another aspect of our invention, when the webbing is of thermoplastic material, the transverse seal portions while heated are relieved of feeding tension by auxiliary clamping members which are artificially cooled, as by passage of a cooling medium through them.

Our invention further resides in the features of combination, construction and arrangement hereinafter described and claimed.

For an understanding of our invention, reference is to be had to the accompanying drawings in which:

Fig. 1 is a front elevational view, with parts broken away, of a machine for making, filling, and sealing gusset-type containers;

Fig. 2 is a detail view, in side elevation, of parts appearing in Fig. 1;

Fig. 3 is a detail view, in side elevation, and on enlarged scale, of parts appearing in Fig. 1;

Fig. 4 is a front elevational view of parts appearing in Fig. 3;

Fig. 5 is a plan view, [illegible] in connection with Figs. 3 and 4;

Fig. 6 is a similar to Fig. 3, except the parts are in a different operating position;

Fig. 7 is a plan view, [illegible] in connection with Fig. 6;

Fig. 8 is similar to Figs. 3 and 6, except the parts are in different operating position;

Fig. 9 shows in perspective a container formed by the mechanism of the preceding figures;

Fig. 10 illustrates a modification of the web-clamping structure shown in Figs. 3 to 8.

Referring to Fig. 1, web material W, fed from a supply roll not shown, is shaped into tubular form by the tools 4 and 5, of construction more fully disclosed in Zwoyer U. S. Patent No. 1,986,422, about the stationary tube or forming member 6 supported by bracket 7 adjustably secured to rod 8 depending from the upper frame member 9 of the machine.

The overlapping margins of web W are joined by a seal-forming device P whose construction and operation are more fully explained in Patent 2,200,971 which issued upon our co-pending application Serial No. 259,748, filed March 4, 1939, thus to form a closed tube T of web material with a seal L extending longitudinally thereof.

To effect engagement of the sealing member 98 of device P with the web margins while the web material is at rest and therefore free of feeding tension and to move member 98 from the web material before the next feeding movement, there is provided a cam 117 secured to shaft 118 driven from shaft 31 by chain 119 which drives sprocket 120 on shaft 118 and is driven by sprocket 121 on shaft 31. The frame 106 which supports sealing member 98 is pivotally mounted upon bar 107 and is biased by a spring, not shown, toward tube 6. While the web is at rest, cam 117 permits the spring to move arm 106 to press member 98 against the overlapping margins of the web shaped about tube 6, and then after a brief dwell forces the arm 106 away from the tube 6 to interrupt contact of member 98 with the webbing before its next feeding movement.

Below the lower open end of the form 6 the tube T of web material is flattened by clamping members of a vertically reciprocating package-forming mechanism F whose construction is hereinafter more fully explained. Closure of the jaws of the device F produces a seal UL transversely of the tube, concurrently to form the bottom of a container C to be filled through form 6, and to close the upper end of a previously filled container C. Downward movement of the device F from the position shown in Fig. 3 to the full-line position thereof shown in Fig. 1 pulls further web material over the form 6 to form a further section of tubing T and to bring the longitudinal margins of further web material adjacent the sealing device P. At the end of the down stroke of the mechanism F, a seal UL previously formed between two filled containers is brought into the path of movement of the blades 81, 82 of a web-severing device, similar to web-severing device KA, which operates concurrently with release of the web material by mechanism F to cut through the seal UL between the [illegible]

5/12

from the web material. The detached container slides from the machine along the chute 10.

The particular machine shown is a dual unit; while aforesaid cycle of operation is being performed upon web material W, the same sequence of operations is being performed by similar mechanism upon the web WA; because the mechanism for operating upon web WA is essentially a duplicate of that described for operating upon web W, its components are identified by the same reference characters plus the letter A.

The feeding and severing mechanisms are driven by motor 11 supported by frame 12 of the machine; a pulley 13 on the motor shaft is connected, as by belt 14, to the pulley 15 on one end of a shaft 16 supported by brackets 17, 18 attached to the frame member 19 of the machine; to the other end of shaft 16 is attached a sprocket 20 which, through chain 21, drives a sprocket 22 on the main control shaft 23 of the machine.

The feeding head or turret H which segregates measured amounts of filling for delivery into the tubes 6, 6A, is driven from shaft 23 through the chain 24 which connects sprockets 25 and 26 on shaft 23 and jack-shaft 27, respectively, chain 28 which connects sprocket 29 on shaft 27 with sprocket 30 on shaft 31, bevel gear 32 on shaft 31, bevel gear 33 on shaft 34, and chain 35 connecting the sprocket 36 on the upper end of shaft 34 to the sprocket 37 on shaft 38 of the feeding head H. The particular feeding head shown, which may be replaced by others for different characters of filling for the containers, comprises a stationary plate 39 suitably held as by brackets 40 to the frame member 9 of the machine and provided with openings in registry with or received by the upper ends of the web-shaping tubes 6, 6A. Plate 42 of the head, which is attached to shaft 38, serves as a support for the open-ended measuring tubes 43 received by or in registry with openings through the plate 42 and also serves to prevent escape of material from the hopper 44 except as provided by the openings through the plate 42 into measuring tubes 43.

The movement of the turret of feeding head H is preferably so timed that material is discharged from the forms 6, 6A into the tubes T, T1 of web material substantially at the end of each feeding stroke of the package-forming and web-feeding devices F, FA.

Reciprocation of the feeding device F is controlled by cam 45 attached to the main shaft 23 of the machine; the periphery of cam 45 is engaged by cam follower or roll 46 extending from the member 47 having a forked end embracing the shaft 23 and pivotally connected at 48 to one arm of a bell-crank lever 49 pivotally mounted at 50 upon a bracket 51 depending from the frame member 41 of the machine. The other arm of bell-crank lever 49 is slotted, as shown in Fig. 2, to allow adjustment of the supporting pin 52 of the roller 53 which engages the under surface of the ledge member 54 adjustably secured to plunger 55 guided at its lower end by bracket 51 and passing through frame member 41 for connection to the cross member 57 through which pass the shafts 58, 58A, to which are secured, respectively, the elongated gears 59, 59A whose lower ends serve to receive the thrust of member 57 and transmit it to shafts 58, 58A. The collars 60, 60A serve to support the two members 61, 62, common to the package-forming mechanisms F, FA, while permitting rotation of the shafts 58, 58A for the purposes hereinafter described.

As the cam 45 rotates, once for each cycle of the machine, the bell-crank lever 49 is oscillated to effect reciprocation of member 57 toward and from its uppermost position, Fig. 3 corresponding with the dotted line position thereof shown in Fig. 1. The length of the stroke or extent of vertical reciprocation of the package-forming mechanisms F, FA may be varied for production of containers of different lengths by adjustment of supporting pin 52 of roller 53 in the slotted end of the bellcrank lever 49. For reasons which hereinafter appear, the slot 1 which receives the pin 52 extends, when arm 49 is in its uppermost position, substantially at right angles to the direction of movement of plunger 55, thus to insure that, regardless of the length of stroke, the uppermost position of the package-forming mechanisms F, FA is always the same.

The two members 61, 62 are biased toward or into engagement with each other by springs, not shown, and are intermittently separated from each other by the cams 66, 66A respectively mounted upon the shafts 58, 58A.

The movement of members 61, 62 toward and away from each other by rotation of shafts 58, 58A is controlled by cam 67 on shaft 68 driven from the main shaft 23 through gearing including the gear 69. The cam follower 71, which continuously engages the periphery of cam 67, is supported at the lower end of a bar 72 which passes through a slot in the frame member 41 for pivotal connection at its upper end to one arm of a bell-crank lever 73 pivotally mounted upon bracket 74 and biased to the position shown in Fig. 1 by the spring 76 extending from the stationary bracket 78. The other arm of bellcrank lever 73 is connected by link 77 to a rack 78, received by guides 79 in the vertical frame members 80 of the machine, and continuously in mesh with gears 59, 59A throughout their reciprocation with the plunger 55. The cam 67 is preferably adjustable angularly with respect to its shaft 68, as indicated in Fig. 1, to permit variation in the timing of the movements of the members 61, 62.

The same cam 67 is utilized to control operation of the web-severing mechanisms K, KA, which may be identical in construction and similar to the web-severing mechanisms shown in aforesaid Zwoyer patent. Suffice to say that concurrently with movement of the members 61, 62, away from each other, the two blades 81, 82, Fig. 6, of the web-severing device K, move toward each other to cut through the webbing intermediate the limits of a seal UL between two adjacent containers, and concurrently a similar set of blades in the head KA severs the webbing WA by cutting through a seal UL between two adjacent containers. Movement of the shaft 67A, which controls the knives of the cutting head KA, is produced by aforesaid reciprocation of rack 78, which is in continuous driving engagement with the gear 69A on shaft 67A; by a similar arrangement, rack 78 controls the operation of the knives 81, 82 of the cutting head K.

As thus far described, the mechanism is not suited to the manufacture of containers of the gusset type. The subsequent description is chiefly concerned with modifications of or additions to aforesaid machine, suiting it for production of such gusset-type containers; it is to be understood, however, that in its broader aspects, and particularly its method aspects, our invention is not limited to improvements upon the particular package-forming machine shown in the aforesaid Zwoyer patent.

Referring to Figs. 3 to 8, inclusive, the heart of

5/113

Plaintiff's Exhibit 5

3

of the forming tube 6, there extends the pair of plates 100 which in effect forms a continuation of the tube 6. The distance between the plates as viewed in Fig. 3 and the distance between the vertical edges of each plate, as viewed in Fig. 4, is such that there is defined a rectangle whose perimeter is at least approximately equal to the perimeter of tube 6 (Fig. 5). The plates 100 are preferably of springy metal to insure their return to the position shown in Fig. 3 after they have been flexed during flattening of the tube T of the web material, as hereinafter described.

The two tucking members 101, 101, preferably wires of springy metal, are fastened at their upper ends to a supporting bracket 101A in such position that, except for restraint imposed upon them by the webbing, they tend to move between the plates 100. Consequently, as the tube T is fed downwardly, as previously described, the tucking members or tools 101, 101 tend to crease opposite sides of the tube, and so start the formation of gusset folds G.

When the plates 100, 100 are moved to the position shown in Fig. 6, as hereinafter described, the tucking tools 101, 101 because of their tension or bias, move toward one another between the plates, as more clearly shown in Fig. 7, to take up the slack in the webbing and so further to tuck in the webbing. To prevent the tucked-in sides of the webbing from being injured by too close approach of the plates 100 and the turn-in tools 101, the former are provided with stops 102 which limit the extent to which the plates 100, 100 can be flexed toward each other.

Referring to Fig. 3, which shows the members 61, 62 in their most separated position and at the top of their stroke, upon one of them, 61, is mounted a clamping or heat-sealing member 103 preferably faced with "Neoprene," an artificial rubber not appreciably affected by the temperatures involved for heat-sealing of Cellophane, Pliofilm, or the like; upon the other of these members, 62, is mounted a complementary web-clamping or heat-sealing member 104 comprising, in the particular example shown, a metal block 105, in which is disposed a thermostat 106, and a metal block 107a in which is disposed a heating coil 126.

In the preferred arrangement shown in Figs. 3 to 8, there are, in addition to the sealing members 103, 104, additional web-clamping members; the lower pair of them, 108, 109, are carried by the members 61, 62, respectively, and are biased to the position shown in Fig. 3 by the springs 110, 111; the upper pair of them, 112, 113, are also carried by the members 61, 62, respectively, and are biased to the position shown in Fig. 3 by the springs 114, 115. When the members 61, 62 are in their most separated position, all of aforesaid clamping members are out of engagement with the web, thus to clear the containers as the package-feeding and forming mechanisms P, PA comprising these members move to their uppermost position.

While the frame members 61, 62 of the mechanisms P, PA, are at the top of their stroke, they move toward one another under the control of cam 67. Referring to Fig. 1, as the cam follower 71 moves off the high section *a* of cam 67, on to the intermediate section *b*, the members 61, 62 move from their position shown in Fig. 3 to the position shown in Fig. 6. During this movement [illegible] members 103 104 and the upper pair of auxiliary clamping members 112, 113 [illegible] the lower free ends of the flexible plates 100, 100 and move them toward one another, thus reducing the tension of the webbing between the plates and so allowing the spring members 101, 101 to tuck in the opposite sides of the tubing T, generally as shown in Figs. 6 and 7. The lower pair of auxiliary clamping members 108, 109, if used, for this intermediate position of the frame members 61, 62, clamp the webbing below the plates 100, 100 and so relieve the tubes T above the clamps 108, 109, of tension due to the weight of the filled containers C1, C2, as yet undetached from the webbing.

As the frame members 61, 62 move downwardly under control of cam 65, they move toward one another from the position shown in Fig. 6 to the position shown in Fig. 8, as follower 71 moves over section *b* of cam 67. By this second movement of the members 61, 62 toward each other, the sealing members 103, 104 apply heat and pressure to the flattened sides of the tube previously engaged by the plates 100, 100 and to the tucked-in sides of the tube previously engaged by the tucking members 101, 101; also, by this movement of members 61, 62 toward each other in their downward movement, the upper pair of auxiliary clamping members 112, 113 tightly clamp the flattened webbing above that portion of it being heat-sealed, thus to relieve the heated webbing of the seal from the feeding tension otherwise exerted upon it during the downward movement of the members 61, 62; the lower pair of auxiliary clamping members 108, 109 relieve the heated seal of tension due to the weight of the filled containers C1, C2.

At the bottom of the stroke of members 61, 62, they are moved, under the control of cam 67, to their separated position shown in Fig. 3; and then under the control of cam 65 they are moved while so separated to the top of their stroke (Fig. 3) for the next web-feeding and package forming stroke.

During the downward feed of the tube T, the tension upon the plates 100, 100 is relieved sufficiently to allow them to return to their position shown in Fig. 3 and the resulting distension of the tube by the plates 100, 100 effects return of the tucking members 101, 101 to their position shown in Fig. 4.

The flexible plates 100, 100 may be replaced by any equivalent structure suited normally to distend the tube T, capable of yielding when engaged by the web-clamping or seal-forming tools to allow movement between them of tucking tools equivalent to the spring members 101, 101; and it is to be understood that for the spring members 101, 101 may be substituted any suitable tucking tools biased to tuck in opposite sides of the tube T between plates 100, 100 or operated by suitable mechanism at proper time in the cycle of operation of the machine.

When it is desired to adapt the machine to make either gusset type containers or [illegible] of the pillow type shown in the aforesaid Zwoyer patent, the plates 100 may be attached to a removable [illegible] having for example a bayonet joint connection to the lower end of tube 6.

Each of the finished containers, as most clearly appears in Fig. 2, is sealed at both ends and [illegible] provided with gusset [illegible] to be [illegible]

[illegible] of plunger 55 [illegible] to adjust the length [illegible] 61, 62 move the

5/104

Plaintiff's Exhibit 5

less always return to the upper position shown in Fig. 3, because of stroke-adjusting arrangement shown in Fig. 2, so to ensure the desired co-operation between plates 186, or equivalent, and the web-clamping members.

The mechanism disclosed and described is suitable for making the gusset type, multi-ply containers shown in Stokes application Serial No. 290,373, filed August 16, 1939.

In the modification shown in Fig. 10, members 61 and 62, and the auxiliary clamping members which relieve the heated seal from tension are similar to corresponding elements shown in Figs. 3, 6 and 8, except they are hollow to provide for passage through them of a cooling medium, such as water. Each of the auxiliary clamping members 112C, 113C, 186C and 188C may be in the form of a hollow bar sufficiently long to extend entirely across the tubing with connections between the interiors of the bars, preferably afforded by flexible tubing, allowing passage of cooling medium through the auxiliary clamping members in any desired manner; the flow of liquid may be in series through the clamping members, or the paths of the stream of cooling liquid may split for passage through the several clamping tools. Preferably, as shown, the auxiliary clamping tools are so shaped they approach as closely as possible the edges of the sealing members 184, 188.

What we claim is:

1. Apparatus for making gusset-type containers from flexible webbing comprising a stationary form about which the webbing is shaped into a tube, means for flattening the tube beyond said stationary form to effect engagement of opposite sides thereof with each other, members movable toward each other beyond said form for tucking other sides of the tube between said opposite sides of the tube before their aforesaid engagement with each other, and mechanism operable intermittently to provide for tucking movements of said members.

2. Apparatus for making gusset-type containers comprising yielding members for distending a tube of flexible material, members for engaging the exterior of said tube and movable between said yielding members, and means for effecting movement of said first-named members toward each other concurrently with movement of said second-named members toward each other between said first-named members.

3. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, yielding members extending within the tube beyond the form to maintain the tube distended, tucking members for engaging the exterior of the tube beyond said form and movable between said yielding members, and members movable toward each other to flatten the tube and move said yielding members toward each other concurrently with movement between them of said tucking members.

4. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, tucking tools in continuous engagement with the exterior of opposite sides of the tube beyond the form and biased for movement toward each other, yielding members within said tube resisting movement of said tucking tools, and means for flattening the tube and concurrently moving said yielding members toward each other to allow tucking movement of said tools.

5. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, tube-feeding means including clamping members movable toward each other to flatten the tube beyond said form and movable away from the form while clamping the tube between them, yielding members extending within the tube beyond the form to maintain the tube distended until they are moved toward each other by said clamping members, and tucking tools operable upon aforesaid movement of said yielding members to tuck opposite sides of the tube between them.

6. Apparatus for making gusset-type containers from flexible webbing, comprising a form about which the webbing is shaped into a tube, sealing means comprising members movable toward each other to flatten the tube beyond said form and form a transverse seal, yielding members within said tube to maintain it distended beyond said form until they yield to the tube-flattening operation of said members, and tucking tools operable during yielding of said members to tuck opposite sides of the tube between them.

7. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, reciprocating feeding means comprising clamping members movable toward each other to flatten the tube between them, and tucking tools beyond said form movable between said members in timed relation to their movement with respect to each other to tuck in opposite sides of the tube in advance of its clamping by said members.

8. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, tube-feeding and sealing means comprising members movable toward each other to seal the tube transversely beyond said form and movable away from said form while clamping the tube between them, and movable members continuously biased in engagement with opposite sides of said tube beyond said form for movement, upon aforesaid movement of said sealing tools toward each other, effecting tucking of said sides of the tube between said sealing tools.

9. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, flexible plates extending from said form as a continuation thereof, members biased in engagement with opposite sides of the tube and normally prevented from moving between said plates by the tensioned webbing, and means for flattening said tube and concurrently bending said plates toward one another to allow said biased members to tuck said opposite sides of the tube between said plates.

10. Apparatus for making gusset-type containers from flexible webbing comprising a stationary form about which the webbing is shaped into a tube, tucking tools for engaging the tube beyond said form, and means for feeding the webbing comprising reciprocating structure movable toward and from said form, members carried by said structure and movable toward each other adjacent the limit of movement of said structure toward said form to clamp the tube adjacent said tucking tools, and means for varying the length of the stroke of said reciprocating structure constructed to maintain constant the relation between said limit of movement of said structure and said tucking tools.

5/115

Plaintiff's Exhibit 3.

11. Apparatus for making containers from flexible thermoplastic webbing comprising a form about which the webbing is shaped into a tube, tube-feeding and sealing means comprising reciprocating structure, heat-sealing means carried by said structure and movable toward each other to clamp the tube between them for movement of said structure away from said form, auxiliary members carried by said structure for relieving the heated portion of the tube from feeding tension, and means for artificially cooling said auxiliary members.

12. Apparatus for making containers from flexible thermoplastic webbing comprising a form about which the webbing is shaped into a tube, tube-feeding and sealing means comprising reciprocating structure, heat-sealing members carried by said structure and movable toward each other to clamp the tube between them for movement of said structure away from said form, auxiliary hollow members carried by said structure for relieving the heated portion of the tube from feeding tension, and means for passing a cooling medium through said members.

13. Apparatus for making gusset-type containers comprising yielding means within a tube of flexible material for distending it, tucking members movable toward each other to tuck in sides of the tube in opposition to said yielding means, and sealing members for engaging and flattening other sides of the tube to include between them the sides tucked in by said tucking members.

14. Apparatus for making gusset-type containers comprising a form about which webbing is shaped into a tube, yielding members within said tube for distending it, biased members engaging opposite sides of the tube externally thereof, and reciprocable web-feeding members coacting adjacent one limit of their reciprocation with said yielding and biased members to produce tucks in said opposite sides of the tube.

15. Apparatus for making and filling gusset-type containers comprising a form about which webbing is shaped into a tube and through which filling is introduced into the containers, movable tucking members biased toward each other into engagement with opposite sides of said tube beyond the form, sealing members movable toward each other transversely to seal the tube, and means including said sealing members for controlling movement of said tucking members to form gusset folds in part included in each of the transverse seals and movable away from each other to effect reverse movement of said tucking members to position non-obstructive to introduction of filling.

16. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, and means for producing gusset folds in opposite sides of the tube comprising flexible plates disposed within said tube and providing a continuation thereof yieldingly distending the tube of webbing.

17. Apparatus for making gusset-type containers from flexible webbing comprising a form about which the webbing is shaped into a tube, spaced yielding members within the tube and extending beyond said form to distend the tube, and means for flattening the tube in opposition to said yielding members and for controlling tucking between said members of the slack in the webbing produced by aforesaid flattening thereof.

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5/116

Plaintiff's Exhibit 5

Aug. 25, 1942. J. Y. ALBERTSON 2,294,220

METHOD OF AND APPARATUS FOR MAKING CONTAINERS

Filed March 13, 1940 2 Sheets-Sheet 1

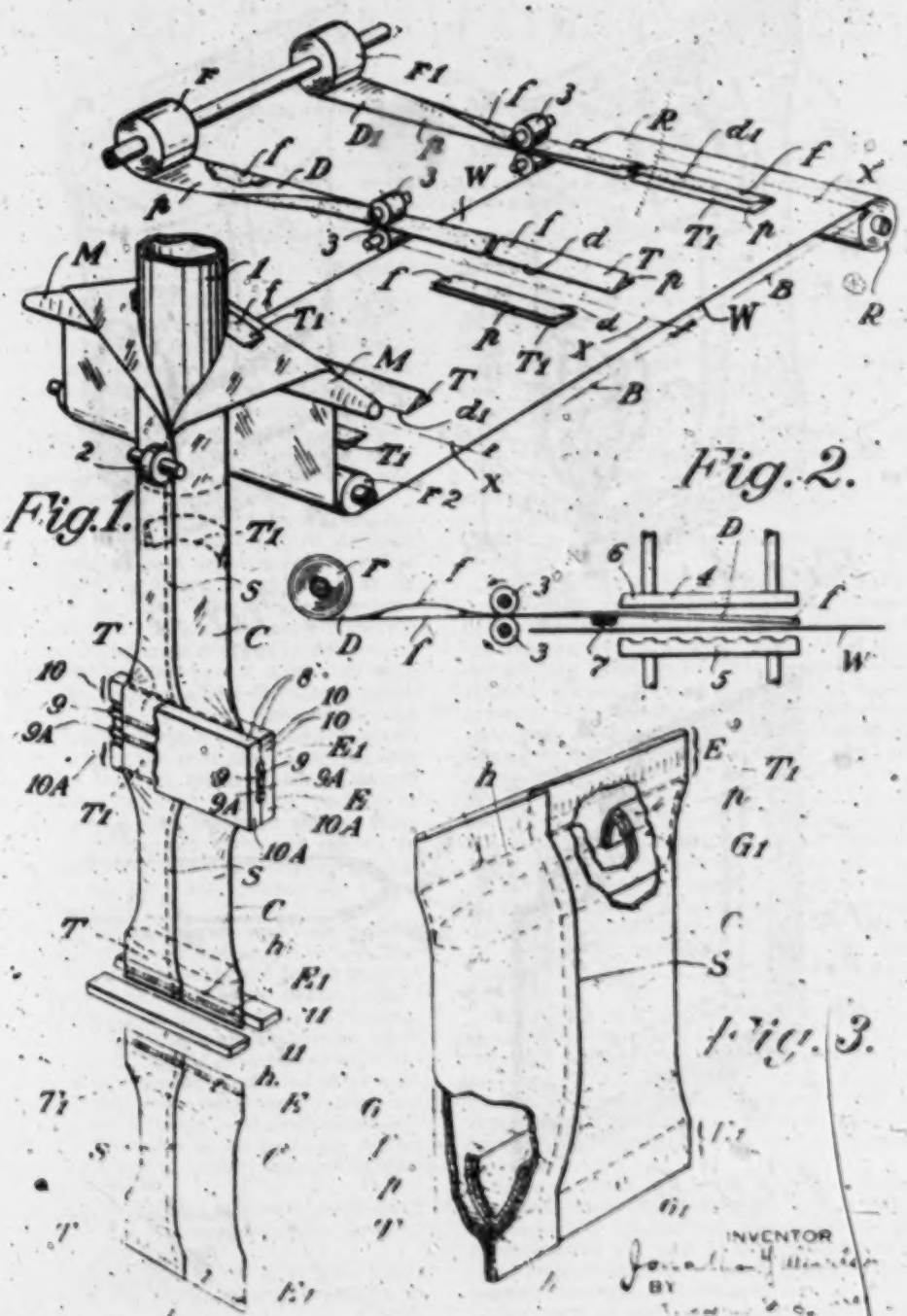

Fig. 1.

Fig. 2.

Fig. 3.

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Aug. 25, 1942. J. Y. ALBERTSON 2,294,220

METHOD OF AND APPARATUS FOR MAKING CONTAINERS

Filed March 13, 1940 2 Sheets-Sheet 2

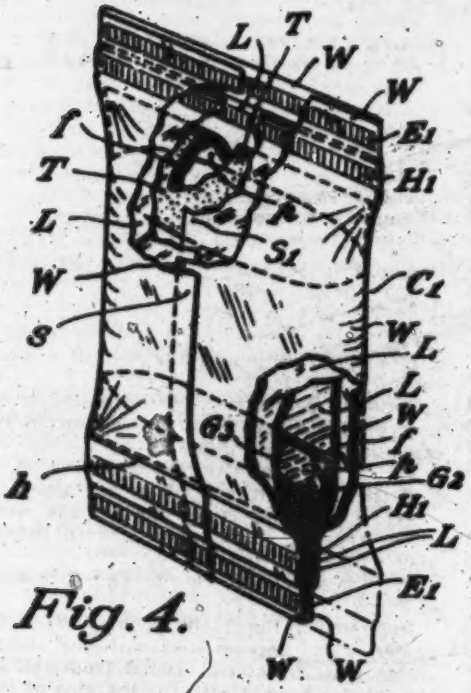

Fig. 4.

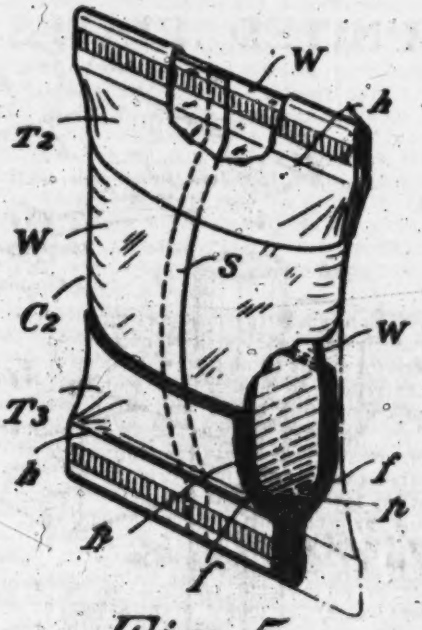

Fig. 5.

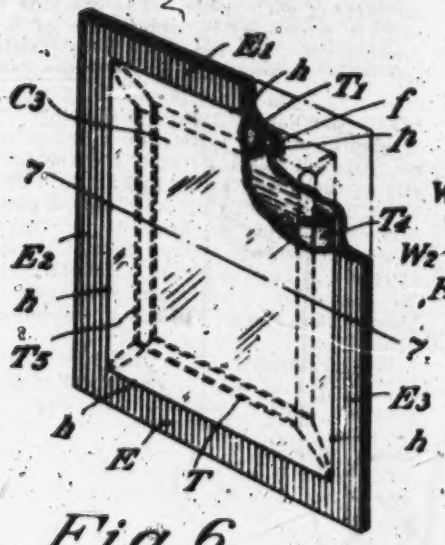

Fig. 6.

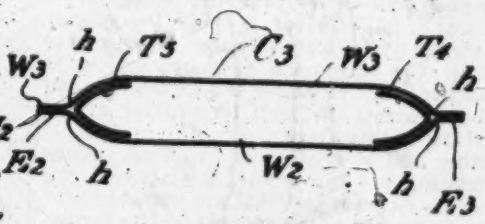

Fig. 7.

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5/124

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Patented Aug. 25, 1942 2,294,220

UNITED STATES PATENT OFFICE

2,294,220

METHOD OF AND APPARATUS FOR MAKING CONTAINERS

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Application March 13, 1940, Serial No. 323,650

12 Claims. (Cl. 93—3)

My invention relates to containers formed from sheet material or webbing, and, particularly to containers for fluids or liquids, reinforced interiorly or exteriorly, to protect their seals or joints from rupture or other injury, and which so reinforced are capable of withstanding unusual forces or pressures accidentally or otherwise applied either exteriorly or interiorly, to the joints or seals; my invention relates to methods of and apparatus for producing such containers.

In accordance with my invention, a container is reinforced adjacent at least one of its seals or joints by an element or strip, of paper or equivalent, which is joined or attached, as by thermo-plastic or other adhesive, to the container walls in such relation with respect thereto that the reinforcing strip or element bridges, or is continuous or jointless across, a joint or seal, or embraces an edge of a seal or joint-forming structure; more particularly, the reinforcing strip or element is disposed within and attached to the inner wall of the container, as in position intervening between the filling in the container and a seal or joint thereof, to bridge the joint or seal; and in accord with a further aspect of my invention, the reinforcing means is applied to the exterior of the container and embraces a seal or extends across the joint terminating at the edge of the seal structure.

Further and in accordance with one method of producing and so reinforcing containers, the reinforcing strips or elements are folded lengthwise and attached to the webbing, before formation into containers, at suitable intervals lengthwise thereof, or to a lining sheet thereon; more particularly, completion of attachment of a reinforcing strip or element is effected after performance of one or more container-forming operations upon the webbing, and preferably concurrently with formation of the container seal or joint it is eventually to protect against rupture or other injury.

My invention further resides in the methods of and apparatus for making containers, hereinafter described and claimed.

For an understanding of my invention, reference is made to the accompanying drawings, in which:

Fig. 1, in perspective, illustrates a method of and apparatus for producing reinforced containers from webbing;

Fig. 2 is a fragmentary view illustrating apparatus for attaching reinforcing elements to webbing and preferably for severing them from the stock from which derived;

Fig. 3 is a perspective view on enlarged scale and partly in section, of a portion of a container shown in Fig. 1;

Fig. 4, in perspective, partly in section and in part broken away, illustrates a portion of another form of my container;

Fig. 5, in perspective, partly in section, shows a further modified form of my container;

Fig. 6, in perspective, illustrates a wafer or pillow type of container reinforced in accordance with the invention;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

Referring to Fig. 1, the webbing W, preferably coated with, impregnated with, or comprising thermoplastic material, is fed from roll R over the tubular form f with the margins of the web overlapping each other. The margins are adhesively joined, as by application of heat and pressure when the web is of thermoplastic material, such as Pliofilm, or water-proofed Cellophane, to form a seal S extending logitudinally of the tube shaped from the webbing. The seal or seam S may be formed by a heated pressure-applying roll 2 during feed of the webbing, generally as shown in Zwoyer Patent No. 1,986,422, or by an intermittently actuated heated plate which presses the webbing while at rest between its feeding movments against form f, generally as disclosed in Letters Patent 2,200,971 granted upon co-pending application Serial No. 259,748, jointly filed March 4, 1939, by myself and another.

When each of the containers to be formed from the webbing W is to be reinforced at both ends, there are applied two folded reinforcing elements or strips T, T1 to each increment or length B of the webbing, corresponding with the length required for a container as defined by the lines x where the webbing eventually is transversely severed.

Each of these elements may be pre-formed and fed from stacks thereof, or fed flat from stacks and then folded; or, and preferably, and as shown in Fig. 1, a pair of them may be cut from their respective strips of stock D and D1 for each feeding movement of the web W.

One face of each of the reinforcing elements T, T1, of paper or other suitable material, p, is coated with any suitable adhesive, preferably hardened thermoplastic, f, and the other face, eventually presented to the filling in the container, is or may be uncoated; or the reinforcing elements and the strips from which they are cut may be of two-ply material, one, p, of paper, for

5/119

example, and the other, *f*, of Pliofilm adhesively attached or thermoplastically bonded thereto.

As the strips D, D1 are fed from rolls *r*, *r1*, by rolls 3, 3, actuated in timed relation to actuations of the within described web-feeding structure, toward and over the webbing W, they are so folded, as by said rolls 3, 3, that both outer faces of the folded strip are those which are of adhesive or adhesively coated. The two strips are oppositely folded so that their lines of fold or creases, *d*, *d1* are respectively presented toward the corresponding ends of their web increment B, i. e., toward the portions of increment B destined to constitute seals to be protected.

While web W and strips D, D1 are at rest between their respective feeding movements, the cold member or stencil 4, Fig. 2, descends to press the adhesive faces of the leading portions of the strips D, D1 against the upper face of the web W backed by heated plate 5, preferably corrugated as indicated, which has substantially concurrently ascended from below web W toward the cold stencil 4, so as to effect adhesive attachment to the upper face of the web of the under or adhesive faces of the folded strips or elements.

Aforesaid portions of strips D, D1 substantially concurrently with their aforesaid adhesive attachment to web W are severed to constitute elements T, T1; for example, and preferably, one edge 8 of the cold stencil 4 co-acts with a blade 7 disposed above the webbing W and over which strips D, D1 are fed as aforesaid, to shear or sever a pair of reinforcing elements T, T1, from their respective strips D, D1 during each descent of the cold stencil 4 toward web W.

After a pair of reinforcing elements T, T1 has been so attached to the webbing W, the latter is fed toward form 1 over idler roll *r2* and member *M* to extent corresponding with the length B of another container, and strips D, D1 are again fed transversely over web W, each to an extent corresponding with the length of reinforcing elements T, T1.

The feed of web W may be effected, as in general accord with aforesaid Ewoyer patent, by a pair of gripper members 8, 8 which at definite intervals of time are moved toward each other to clamp and flatten the tube of webbing beyond the lower end of form 1; thereupon members 8, 8 are moved downwardly to the position shown in Fig. 1, to extent corresponding with the length B of a container.

The web-engaging members 8, 8 carry, or themselves comprise, pairs of heat sealing members 9 and 9A which concurrently form neighboring seals E, E1, destined to become, respectively, the upper and lower container seals; the upper seal becomes the bottom seal E1 of a container C to be filled, and the lower seal becomes the upper seal E of a previously filled container, all as more fully described in aforesaid Letters Patent 2,200,971.

As the web is shaped into a tube upon hollow form 1, each of the elements T, T1 extends substantially half way around the inner periphery of the tube, Fig. 1, with its unapplied coated face *f* presented toward the remainder of the periphery for attachment thereto as hereinafter described.

The web-engaging members 8, 8 carry, or comprise, the pairs of heat and pressure applying sealing members 10, 10 and 10A, 10A; the lower sealing members 10A, 10A engage and flatten that region of the tube of webbing W within which a reinforcing element T1 is disposed so to effect bonding of the coated face of the reinforcing element T1 with the internal faces of the flattened walls of tube of webbing immediately below the seal E, concurrently formed by tools 9, 9A. Similarly, and concurrently, the sealing members 10, 10 effect attachment of the coated or prepared face of a reinforcing element T with the internal faces of the flattened walls of the next lower container immediately above its lower seal E1 concurrently formed by tools 9A, 9A.

Between successive feeding movements of the vertically reciprocable grippers 8, 8, filling is introduced into the containers through the passage within form 1; the particular type of container herein disclosed is particularly suited for liquids, including such as oils, introduced into it preferably while its lower end is clamped by the sealing elements 10, 10. Upon separation from each other of the members 8, 8, the filling within the container, particularly when a liquid, distends the bottom of the container so that the lower reinforcing element T assumes the position shown in Fig. 3, in which it bridges the joint between the container walls sealed to each other to constitute seal E1, so protecting the joint or seal against pressure by the filling due either to pressure upon the exterior of container C or to internal pressure by the filling, due, for example, to inertia of the filling, as when the filled container is dropped or otherwise subjected to accident.

The reinforced containers so formed and filled are thereafter in succession detached from the webbing, as by the knives 11, 11, actuated in timed relation to aforesaid rolls 3, 3 and members 4, 5, 6, 7 and 8, 8. Knives 11, 11 transversely sever the webbing between the bottom seal E1 of one container and the top seal E of the next previously formed container. The seals E1 and E may be formed as a single wide seal, transversely severed by the knives 11, 11 to detach the lowermost container from the webbing; in such case, each pair of tools 9, 9A is replaced by a single wide tool.

The relation of reinforcement T to the container is shown in Fig. 3; the outer face or ply *f* is adhesively attached to the inner faces of both side walls G, G1 of the container; the strip T, or its outer ply *p*, forms a container partition, bottom, cap or trough, with or on which the filling contacts or is supported, and which is continuous across the joint or inner edge or line of the seal E. The relations of the top reinforcing element T1 to the top seal E and walls G, G1 of the container are the same.

When containers, not so reinforced, are dropped or pressed, as during handling or transport, the filling, particularly when liquid, tends to spread apart the walls of the seal from their inner limits or edges outwardly, and to break the container walls adjacent these edges generally along line *h*. Both of these tendencies are overcome by the reinforcing elements T and T1; the continuity of the strips T and T1 across the inner edges or exposed joints of the seals E and E1 respectively, prevents them from being forced open by the weight of the liquid, or other filling, and the attachment of the sides of the strips T, T1 to the webbing adjacent the seals there reinforces the web material where it is weakest because of aforesaid heat-sealing operation.

The containers C are preferably formed, sealed, filled and detached by the continuous method described; however, they may be formed

5/120

from individual sheets each corresponding with increment B of web W, Fig. 1.

In the modification shown in Fig. 4, the container C1 is of multi-wall construction; preferably, each of the inner seals, of which H1 is exemplary, is within a related outer seal, of which seal E1 is exemplary. The inner and outer seals are preferably formed by attachment to each other of associated areas of the same sheet material; for example, the seal E1 is formed by applying heat and pressure to a tubular section formed from web or sheet W and the seal H1 is formed by applying heat and pressure to overlying areas of sheet L forming the inner container wall or lining. Multi-wall containers of this type may, as described and claimed in Letters Patent 2,257,823 to Stokes, be formed from a continuous web W to which is applied, at suitable intervals, a series of sheets L, which are shaped concurrently with the webbing to form a series of nested tubular sections which are transversely sealed to form a succession of multi-wall or lined containers.

To form the containers shown in Fig. 4, by modification of the method shown in the aforesaid Stokes patent, there is applied to each of the successive sheets L, generally as shown in Fig. 1 hereof, a pair of reinforcing elements T, T1 to strengthen the ends of the containers, as in Fig. 3, to prevent them from opening or breaking at the seals when accidentally dropped or unduly pressed.

As shown in Fig. 4, the reinforcing element T of container C1 bridges the inner edge of the joint of the inner seal H1, and is attached, on both sides of the seal H1, to the inner faces of the opposite sides C2, C3 of the inner container wall or lining L.

The inner container L may be of paper, Cellophane, Pliofilm, or any suitable sheet material, preferably coated with, impregnated with, or comprising thermoplastic material, and the outer container of webbing W may be of the same or any suitable different material, but, as previously stated, is preferably capable of heat-sealing. The inner container L may be entirely free of attachment to the outer container, or may be in part, or wholly, joined thereto.

The seal S1 extending longitudinally of the inner container may be formed by adhesively joining overlapping margins of the sheet material L, and the seam so formed may underlie, or be staggered with respect to, the longitudinal seam S of the outer container.

The container C2, Fig. 5, is strengthened adjacent its seals E, E1 by the externally applied reinforcing elements T2 and T3 which embrace the seals; there may be also provided the internal reinforcing elements T and T1, Figs. 1 and 3. The reinforcing element T2 is adhesively applied to one face of the container C2 adjacent its upper seal E, extends across or embraces the seal over or at its upper exterior edge, and then extends downwardly across the other face of the seal into adhesive attachment with the opposite face of the container.

Similarly, the reinforcing element T3 is adhesively applied to one face of container C2 adjacent the seal E1 and extends downwardly across one face of the seal and under its outer edge, and thence, upwardly against the other face of the seal into adhesive engagement with the other side of the contain-

Each of the reinforcing elements T2, T3 may [illegible] only the elements, with adhesive freshly applied to their inner faces, are brought into contact with the outside of the container and held there until the adhesive has sufficiently set; preferably, these reinforcing elements are faced with hardened thermoplastic, previously applied either as a coating, or as a layer of Pliofilm, or the like. In the latter case, the reinforcing elements are simply folded over the ends of the container, and heat and pressure applied to bond them to the sides and ends of the container.

In brief, each of the elements, T2, T3, is preferably, throughout its length and width, adhesively attached, preferably thermoplastically, over the sealed ends of container C2.

The container C2 may be formed generally in accordance with the method of Fig. 1, and one or both of the reinforcing elements T2 and T3 applied after detachment of the container from the webbing; or if inner elements T, T1 are to be omitted, then container C2 is formed as in aforesaid Zwoyer patent, and elements T2, T3 are thereafter applied.

In this modification, as in Figs. 3 and 4, the sheet material constituting container C2 is reinforced adjacent the edges of each of the seals E, E1 along the lines *h*, but in Fig. 5, the reinforcing elements do not, unlike Figs. 3 and 4, effectively prevent opening of the seals E, E1 along their edges inside the container.

The container C3, Figs. 6 and 7, is formed from two sheets W2, W3, preferably of, or comprising, thermoplastic material, joined at their edges to provide the four fin-type, or exteriorly projecting, seals E, E1, E2, and E3. The edges inside the container of the two end seals E, E1 are bridged by reinforcing elements T1 and T respectively, so that a cross-section of each end of this container is identical with that of the modification shown in Figs. 1 and 3. The edge inside the container of each of the seals E2 and E3 is similarly bridged by reinforcing elements T4 and T5, Fig. 7, each having the same relation to its associated seal as the reinforcing element T or T1 has to its associated seal E or E1.

The adhesively coated face of each of the four reinforcing elements T1—T4, is attached to the inner face of the container wall adjacent to and on opposite sides of the edge of a seal across which the reinforcing element is continuous. Thus the inner edges of all seals of the container are protected against rupture or opening by pressure applied to or by the filling of the container, and, as in all modifications previously described, the container is reinforced at and adjacent the edges of the seals to prevent its breakage along lines *h* defined by those edges of the seals.

The container C3 may be formed, as shown in Figs. 6 and 7, from two individual sheets or, preferably, by a continuous method, substantially similar to that disclosed in Fig. 5 of the aforesaid Stokes patent, from two continuous webs.

What I claim is:

1. A method of making a container which comprises shaping sheet material and attaching margins thereof to each other to form a tube, flattening the tube at least at one end and adhesively attaching to each other opposite sides of the flattened end to form a seal, and attaching to said sheet material a reinforcing strip which is continuous across an edge of said seal and is adhesively attached to areas of said sheet material [illegible] opposite sides of the container and [illegible] but exclusive of areas thereof joined

5-12-51

Plaintiff's Exhibit 5

2. A method of forming a container which comprises folding a reinforcing element and adhesively attaching one face thereof to sheet material, shaping and effecting adhesive attachment of margins of said sheet material to form a tube partially internally bounded by said reinforcing element, flattening said tube to effect attachment of another face of said reinforcing element to the sheet material to complete its attachment to the internal periphery of said tube, and transversely sealing said tube immediately adjacent the fold of said element.

3. A method of making containers which comprises shaping a web to form a tube, applying to the web, before shaping thereof, a series of folded reinforcing elements, transversely sealing the tube adjacent the folded edges of said elements to form containers, and, substantially concurrently with formation of each transverse seal, effecting adhesive attachment of one of said reinforcing elements to the inner faces of opposite walls of the flattened tube substantially throughout the length of the inner boundary of the seal.

4. A method of forming containers which comprises shaping web material to form a tube, attaching to the webbing, before shaping thereof, pairs of folded reinforcing elements spaced longitudinally of the web, transversely flattening and sealing the tube between each pair of said folded reinforcing elements to form and seal the adjacent ends of successive containers, and substantially concurrently effecting attachment of the pair of elements to the inner faces of walls of the flattened tube to reinforce said ends of said successive containers adjacent their said sealed ends and to bridge the inner boundary of each of said seals.

5. Apparatus for making containers comprising means for feeding a web, mechanism for applying folded reinforcing elements at intervals along the web, a form over which the web is fed by said means to shape it into a tube having said elements internally thereof, and means for flattening the tube and effecting attachment of each of said folded elements to the inner faces of sides of the flattened tube.

6. Apparatus for making containers comprising means for feeding a web, mechanism for applying folded reinforcing elements transversely of the web at intervals lengthwise thereof, a form over which the web is fed by said means to shape it into a tube having said elements internally thereof, means for transversely flattening and sealing the tube adjacent each of said elements, and means for effecting attachment of each of said folded elements to the inner faces of sides of the flattened tube.

7. Apparatus for making containers comprising means for feeding a web, mechanism for applying spaced pairs of reinforcing elements transversely of the web at intervals lengthwise thereof, a form over which the web is fed by said means to shape it into a tube having said elements internally thereof, and means for transversely flattening and sealing the tube between said elements of each pair, and for substantially concurrently effecting their attachment to the inner faces of sides of the flattened tube.

8. Apparatus for making containers comprising means for feeding a web, mechanism for applying pairs of reinforcing elements transversely of the web at intervals lengthwise thereof, a form over which the web is fed by said means to shape it into a tube having said elements internally thereof, means for transversely flattening and sealing the tube between the elements of each pair, and for substantially concurrently effecting their attachment to the inner faces of sides of the flattened tube, and means for transversely severing the webbing between said elements of each pair.

9. Apparatus for making containers comprising means operating intermittently to feed a web, means operating in timed relation thereto to feed strip material and for concurrently folding and cutting said strip material to form folded reinforcing elements and for applying them transversely of the web at intervals lengthwise thereof, a form over which the web is fed by said web-feeding means to shape it into a tube having said reinforcing elements internally thereof, means operating in timed relation to said web-feeding means for flattening and transversely sealing the tube adjacent each of said folded reinforcing elements, and means for effecting attachment of each of said elements to the inner faces of the sides of the flattened tube.

10. Apparatus for making containers comprising means operating intermittently to feed a web, mechanism operating in timed relation thereto to apply reinforcing elements at intervals along the web, a form over which the web is fed by said means to shape it into a tube having said elements internally thereof, and means operating in timed relation to said web-feeding means for transversely flattening and sealing the tube between a pair of said elements and for effecting attachment of at least one of said elements to the inner faces of opposite sides of the tube to bridge a boundary of the flattened, sealed portion of the tube.

11. Apparatus for making containers comprising means for feeding a web of thermoplastic material, mechanism for applying folded reinforcing elements transversely of the web at intervals lengthwise thereof and for effecting their thermoplastic attachment thereto, a form over which the web fed by said means is shaped into a tube having said reinforcing elements internally thereof, and heat-sealing means for transversely sealing the tube adjacent each of said reinforcing elements and for effecting their thermoplastic attachment to the inner faces of the sides of the tube.

12. Apparatus for making containers comprising means for feeding a web, mechanism for intermittently feeding strip material to the web and for folding said strip material, and means operating in timed relation to said mechanism for detaching portions of said strip material to constitute folded reinforcing elements and for concurrently applying a face of each of said reinforcing elements to said web.

JONATHAN Y ALBERTSON.

5/22

Plaintiff's Exhibit 5

Sept. 21, 1943. J. S. STOKES 2,330,015

CONTAINER

Original Filed Aug. 16, 1939 2 Sheets-Sheet 1

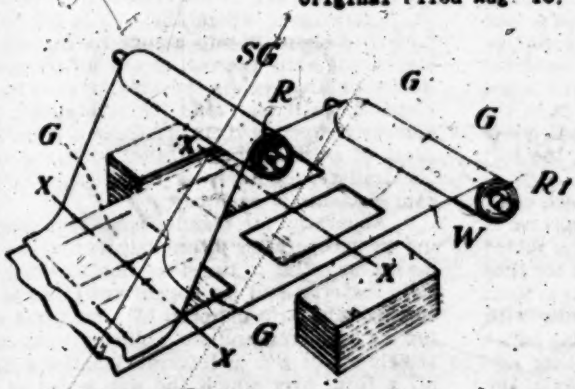

Fig. 2.

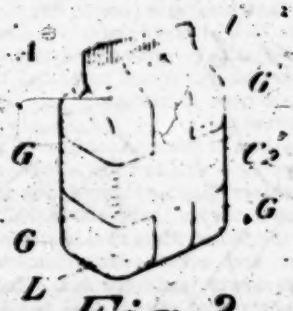

Fig. 3.

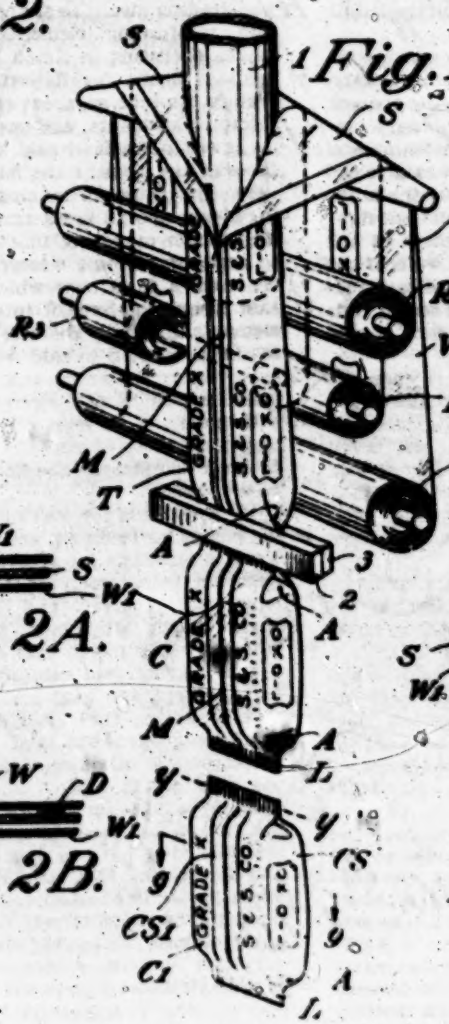

Fig. 1.

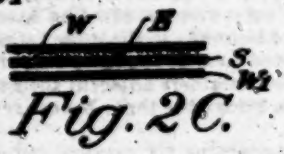

Fig. 2C.

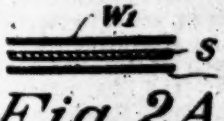

Fig. 2A.

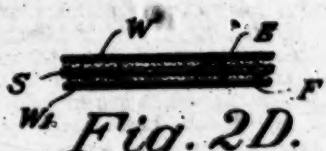

Fig. 2D.

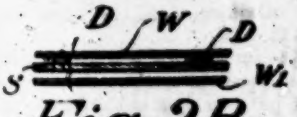

Fig. 2B.

INVENTOR

BY

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57/129

Plaintiff's Exhibit 5

Sept. 21, 1943. J. S. STOKES 2,330,015

CONTAINER

Original Filed Aug. 16, 1939 2 Sheets-Sheet 2

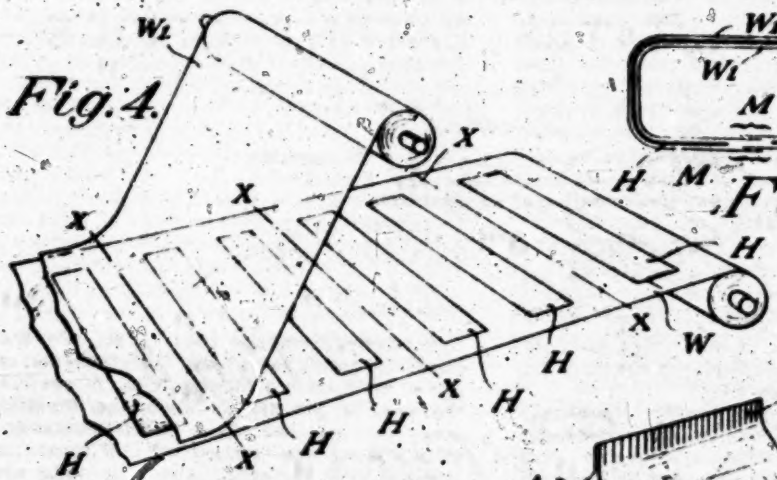

Fig. 4.

Fig. 6.

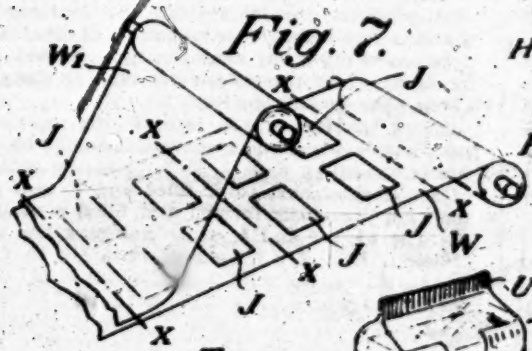

Fig. 7.

Fig. 5.

Fig. 9.

Fig. 8.

Fig. 11.

Fig. 10.

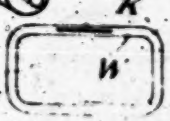

Fig. 12.

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5/130

Plaintiff's Exhibit 5

Patented Sept. 21, 1943 2,330,015

UNITED STATES PATENT OFFICE

2,330,015

CONTAINER

John S. Stokes, Huntingdon Valley, Pa., assignor to Stokes and Smith Company, Philadelphia, Pa., a corporation of Pennsylvania

Original application August 16, 1939, Serial No. 290,378. Divided and this application July 20, 1940, Serial No. 346,477

4 Claims. (Cl. 229—55)

My invention relates to multi-ply containers made of flexible sheet material, particularly Cellophane, Pliofilm and the like.

In accordance with my invention, the plies of container material attached to each other at the ends of the container retain between them, with or without attachment thereto, one or more elements which may be utilized solely for purpose of display, solely for reenforcement of the container, or for both purposes; more particularly, in one form of multi-ply container, there are two elements between the plies, each element forming a substantially continuous band at one end of the container to reenforce the corners and edges whereas, in another form of container, there are two pairs of elements between the plies, each element reenforcing two corners of the container.

My invention further resides in containers having the features hereinafter described and claimed.

This application is a division of my application Serial No. 290,378, filed August 16, 1939, upon which has issued Letters Patent #2,260,664.

For illustration of various forms of containers made in accordance with my invention, and of preferred methods of making them, reference is to be had to the accompanying drawings in which:

Fig. 1 in perspective illustrates the formation of filled containers from webbing;

Fig. 2 in perspective illustrates the formation of multi-ply webbing suited for making another type of container;

Figs. 2A, 2B, 2C and 2D are sectional views of multi-ply webbing referred to in explanation of Fig. 2 and other figures;

Fig. 3 in perspective shows a filled container made from the webbing of Fig. 2;

Fig. 4 in perspective illustrates the formation of another type of multi-ply webbing;

Fig. 5 in perspective shows a container made from the webbing of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 in perspective shows the formation of another type of multi-ply webbing;

Fig. 8 in perspective shows a filled container made from the webbing of Fig. 7;

Fig. 9 is a section taken on line 9—9 of Fig. 8;

Fig. 10 illustrates formation of another type of multi-ply webbing;

Fig. 11 shows a container made from the webbing of Fig. 10;

Fig. 12 is a section taken on line 12—12 of Fig. 11.

Referring to Fig. 1, the webs W, W1 removed respectively, from the rolls R, R1 are shaped about the hollow form 1 and their marginal edges joined to form a multi-ply tube T; preferably, the webs W, W1 are of Cellophane, Pliofilm, or other web material which is thermoplastic because coated, impregnated with, or consisting of thermoplastic material; when the webs are of such material, the joinder of their overlapping margins is effected by application of heat and pressure effected, for example, by a heated roll or platen which presses the overlapping margins of the webs against the form 1.

Below the end of the form 1, the multi-ply tube T is flattened and transversely sealed by the heated clamping tools 2, 3, to close the bottom of a container next to be filled and to seal the top of a previously formed and filled container C. The tools 2 and 3, while clamping the web between them, are moved downwardly to feed additional web material from the rolls R, R1 over the form 1 where their edges are joined to form a further section of tubing T with longitudinal seam M. When the tools 2, 3 are released and again moved to the clamping position shown in Fig. 1, there is sealed the upper end of another container which, between the successive clamping movements of the tools 2, 3, was filled by introduction of material through the hollow form 1. Thus, by repeated clamping movements of the tools 2, 3, and their downward movement, there is formed a succession of filled containers; machines suitable to perform aforesaid steps are shown in Swoger Patent No. 1,988,422, Sonneborn et al. application Serial No. 260,748, filed March 4, 1939, Patent No. 2,208,971, May 14, 1940, and Maxfield application Serial No. 268,837, filed May 4, 1939, Patent No. 2,199,768, May 7, 1940.

To produce the "square" type container shown in Fig. 1 and other figures, the opposite sides of tube T are tucked in before the tube is flattened by sealing tools 2, 3, thus to form the gusset folds A. A suitable mechanism for effecting this tucking operation is described and claimed in Sonneborn et al. application Serial No. 297,494, filed October 2, 1939, Patent No. 2,294,218, August 25, 1942.

In accordance with the present invention, the container is formed from multi-ply webbing shaped and marginally joined to comprise nested tubes which are substantially free of attachment to each other except at the transverse seals formed by the tools 2, 3, or equivalent, defining the ends of the containers. The inner and outer tubes, depending upon the method of sealing, may be attached to each other by joinder of

5/1/35

Plaintiff's Exhibit 5

their marginal seals or may be entirely free of attachment except at the transverse seals.

The space between these two tubes is utilized, in the modification shown in Fig. 1, to receive the strips S, S1, fed from the rolls R2, R3, between the webs W, W1 as they pass toward the form f.

The strips S, S1, so introduced between the nested tubes forming the multi-ply tube T, may serve as reenforcements for the webs W, W1; the strips S, S1 may be of the same material as the webs W1, W2 or of different material; they may, for example, be paper, fabric, metal foil, or other sheet material. When the web W1 is of transparent material, such as Cellophane or Pliofilm, either or both of the strips S, S1 may be decorated or printed for display purposes to avoid need for use of expensive printed Cellophane, Pliofilm, or like material.

For forming filled containers, each of the transverse seal sections formed by the tools 2, 3 between the successive containers is severed transversely intermediate its horizontal edges so that the lower part of it forms the seal U for the upper end of one container and the upper part of the same seal section forms the seal L for the lower end of the next container. When, however, it is desired to make open-end containers subsequently to be filled, each transverse seal section is cut along one edge, for example y—y, instead of intermediate its edges. In either case, when the multi-ply tube T is severed to detach an individual container, the reenforcing strips S, S1 are concurrently cut to leave within the multi-ply wall of the container the two elements CS, CS1 cut from the strip S, S1, respectively.

Particularly when the multi-ply containers are filled and sealed at both ends, the elements CS, CS1, within each container, may be free of attachment to either the inner or outer ply and may be held in place within the multi-ply wall by the clamping effect of the end seals and by some adhesion at the end seals between S, S1, W and W1; or when the strips S, S1 are of thermoplastic material, they may be free of attachment within the multi-ply wall except where firmly joined to the inner and outer tubes or plies by the sealing action of the tools 2, 3.

When the sole or principal purpose of strips CS, CS1 is to reenforce the webs W, W1, it is preferable they be left free, as above described, within the multi-ply wall, Fig. 2A, that the container may more readily conform to a shape induced by pressure without undue distortion, and so be less apt to break or crack at its corners or edges; moreover, movement of the strips within the plies reduces the possibility of coincidence of weakened areas of the plies and strips.

However, as shown in Fig. 2B, the strip S or S1 may be attached at small spaced areas, indicated generally by the dabs or spots D of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2C, the strip S or S1 may be attached throughout one face thereof, as indicated by the coating E of adhesive, to one or the other of the webs W, W1; or, as shown in Fig. 2D, both faces of strip S or S1 may be, throughout, attached to both webs W and W1, generally as indicated by adhesive coatings E, F. It is to be understood that the dotted areas D, E, F represent attachment by adhesive, or attachment by heat-sealing of thermo-plastic materials.

The number of strips introduced between the webs W, W1, Fig. 1, may be smaller or greater than two; however, when the webs W, W1 are of transparent material, the total width of the strip or strips introduced between the webs is, particularly if the strip or strips are opaque, less than the circumference of the completed containers, thus to provide for inspection of the container contents through transparent wall structure of the container beyond the internal strip.

When the outer web W1 is of transparent film, such as Cellophane, Pliofilm, or the like, the finish of the paper strips S, S1 need not be of high grade because the sheen of the film insures a smooth, pleasing appearance of the container; the covering of strips S, S1 by the transparent film W1 also preserves the legibility of the printing on the container because the film, compared with the paper strips, has negligible tendency to absorb grease, oil, or the like, during handling of the containers.

In the modification shown in Fig. 2, the webbing again comprises two webs W, W1 fed from supply rolls R, R1 toward a form f, such as shown in Fig. 1. While the webs are moving or at rest in their path from the supply rolls R, R1 to the form f, there is introduced between them a series of groups of elements G which are spaced from each other transversely and longitudinally of the web; preferably, the longitudinal spacing between the elements G is materially less than the distance, between lines x—x, corresponding with the length of web required for one container.

Consequently, when the composite web W, W1, G, is shaped around the form f, there is produced a multi-ply tube T within, whose multi-ply wall there are two series of longitudinally spaced elements G; the sealing tools 2, 3 flatten the multi-ply tube and seal it transversely across each pair of elements G, and subsequently knife structure, not shown, severs the multi-ply tube transversely within the limits of each seal section, thus to form a series of filled containers similar to that shown in Fig. 3.

Assuming the elements G are of thermoplastic material, each of them, in the package C2 shown in Fig. 3, is in part thermoplastically bonded into one end of one of the seals U or L and the major or remaining part of each element G may be free of attachment to either of the inner or outer plies of the package. Each of the elements G overlies and reenforces that part of the package which is most susceptible to breakage; namely, the corners and edges and particularly the sharp bends within the gusset folds A at the corners of the container at which its closed end walls, top and bottom, meet the side walls.

The elements G may be fed from stacks SG thereof, Fig. 2, or may be cut from strips and fed in successive groups between the webs W, W1.

To preclude possibility of displacement of the elements G after engagement with one or both of the webs W, and until they are held in place as by the sealing performed by the tools 2, 3, they may be attached to web W, for example, at one or more small areas; when the elements G and web W are of thermoplastic material, this may be effected by stencilled adhesive applied in advance of the region of engagement between the webs W, W1.

Though superficially resembling the type of container shown and described in my copending application Serial No. 277,132, filed June 3, 1939, Patent No. 2,259,864, October 21, 1941, the con-

5/126

tainer C3, Fig. 3, is an improvement both from standpoint of appearance and strength: because the reenforcing elements G are not attached to both and preferably neither of the plies, there is greatly decreased tendency for the material of the container wall to be weakened by repeated flexure at any definite place.

Preferably, as shown, the total area of the elements G is less than that of the container C3, so that when the webs W, W1 of the multi-ply wall are transparent, the contents are visible from the exterior of the container through its wall beyond the reenforcing elements which are usually, though not necessarily, opaque.

In the modification of Fig. 4, while the webs W, W1 are en route to the tube 1, about which they are shaped and their marginal edges joined to form a multi-ply tube, there is disposed between them a series of longitudinally spaced elements H having, in general, the purpose and function of the strips S, S1 of Fig. 1 and the elements G of Fig. 2. Each pair of elements H, H is so spaced longitudinally of the web that the distance between their remote edges measured longitudinally of the web is less than the length of web material, between lines x—x, required to make a container. The elements H may be entirely free of attachment to either or both of the webs W, W1 or each of them may be attached, at least in one or two small areas, to at least one of the webs, to prevent their displacement during formation of the containers.

As the composite webbing, comprising the webs W, W1, and reenforcing elements H, is shaped about the form 1, there is produced a multi-ply tube whose inner and outer plies are unattached except at the transverse seals formed by the tools 2, 3 and perhaps additionally at the longitudinal seals M, dependent upon the manner in which they are formed. In any event, each container formed from the webbing of Fig. 4 comprises intermediate its ends, as shown in Fig. 5, two bands H lying within its multi-ply wall and substantially encircling it (Fig. 6). These bands may serve simply to reenforce the package C3, or additionally or alternatively, they may be used for decorative or display purposes when at least the outer web W1 is of transparent material such as Cellophane or Pliofilm. When both webs W, W1 are of transparent material, the contents of the container C3 are visible between the two encircling elements H, H.

When used for reenforcing purposes, the width of the elements H should be such that they overlie the corners of the package C3 and reenforce the sharp bends within the gusset folds A at its corners formed by the meeting of the closed end walls with the side walls; because the reenforcing elements H, H are substantially free of attachment to each of the plies or tubes, there is absent the stiffening or embrittling effect of adhesive which would stiffen the wall and make it more susceptible to breakage; furthermore, because the elements H are free of attachment to the inner and outer plies, the possibility of relative movement lessens the tendency for the wall locally to weaken at any definite place.

Referring to Fig. 7, while the webs W, W1 are moving or at rest on their way toward the form 1, Fig. 1, there is introduced between them a series of groups of elements J; each group comprises four elements spaced from each other transversely and longitudinally of the web. The distance between the remote edges of each pair of elements J, J, measured longitudinally of the web, is less than the distance between the lines x—x corresponding with the length of webbing required for a container. The elements J may be free of any attachment to the webs, or they may be attached in part or in whole to either or both of the webs, generally as shown in Figs. 2B–D. Preferably, they are substantially entirely free of any attachment.

The shaping of the webbing and joinder of its marginal edges about the form 1 results in a multi-ply tube between whose inner and outer walls there are included a series of groups of elements J; the sealing tools 2, 3 flatten the multi-ply tubing transversely at intervals to define a series of containers C4, Fig. 8, each having within its multi-ply wall and between its ends four reenforcing elements J, each embracing and reenforcing one corner of the finished container. When at least the outer ply is transparent, any one or more of the elements J may have thereon decoration or printing visible from the exterior of the package and whose visibility is preserved by the overlying and protective web W1.

In this package, like package C3, Fig. 5, the reenforcing elements terminate short of the end seals to afford increased stability of the package when the lower seal is turned under to square the bottom.

It is quite common to include premium slips, coupons, souvenirs, and the like, in packaged solid materials, but, for obvious reasons, it has not been feasible to do so with liquids. In the modification of my invention shown in Figs. 10 to 12, the space within the multi-ply wall of the containers is utilized to hold such souvenir, coupon, or the like, regardless of whether the contents of the container be liquid or solid.

Referring to Fig. 10, before the webs W, W1 are shaped about the tube 1, Fig. 1, there is introduced between them a series of elements K generically representative of a souvenir, premium coupon, advertising pamphlet, or the like, at intervals each substantially equal to the length of webbing required for a container. Consequently, when the edges of the webbing are joined to form a multi-ply tube, there is within the multi-ply wall of the tube a series of elements K which are isolated from one another when the multi-ply tube is flattened by the sealing tools 2, 3 to form a series of containers each having within its multi-ply wall one of aforesaid elements K. Because the position of element K within its container is ordinarily of no significance, so long as there be one per package, it may not be necessary to attach the elements K to either web, Fig. 10.

In any of the modifications above described, there may be introduced between the nested tubes a conditioning agent or agents serving to maintain or enhance the strength of the container walls; for example, steam or moisture may be introduced between the webs, particularly when of Cellophane, to prevent embrittlement. Another suitable conditioning agent is glycerine which is preferably introduced by incorporating it in the adhesive used, generally as shown in Figs. 2B–D, to attach a reenforcing strip or element within the multi-ply wall of the container. In like manner, moisture may be introduced within the multi-ply wall of the containers by its incorporation in the adhesive used to attach a reenforcing element or strip to one or both of the plies.

In any of the modifications, the number of plies in the container wall may be increased by using additional webbing and shaping it to form one or

5/127

more additional tubes nesting with those illustrated.

In any of the modifications herein described, after introduction between them of one or more strips such as 8—88, or elements G—K, the webs, before or after they are shaped into tubing, may be joined to each other throughout and to the introduced strips or elements in any known manner suited to the materials comprising the webbing and the interposed strip or elements.

What I claim is:

1. A multi-ply container comprising at least two nested substantially rectangular tubes flattened and attached to each other at their opposite ends to form seals and define opposite end walls of the container and whose unattached portions not included in said seals define pairs of adjacent side walls of the container, and reinforcing sheet material free of said seals and of extent longitudinally of the container substantially less than the length of either of said tubes, disposed between said tubes in position to reinforce corners of the container at which the end walls thereof meet pairs of aforesaid adjacent side walls.

2. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and reinforcing elements disposed between said tubes at regions not included in the seals and in which they are sharply folded into aforesaid gussets, unattached to said tubes in avoidance of embrittlement of said material at and adjacent the corners of the container.

3. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and a pair of reinforcing elements extending perimetrically of opposite ends of the container, each disposed between said tubes at regions not included in the corresponding end seal but included in the adjacent regions comprising the gusset folds at said end and therein unattached to said tubes in avoidance of embrittlement of said material at and adjacent four corners of the container.

4. A filled multi-ply container comprising nested tubes of flexible material sealed at their opposite ends to close and define opposite ends of the container and folded into gussets to provide squared side and end walls, and two pairs of reinforcing elements each disposed between said tubes in a region not included in the corresponding end seal but included in an adjacent region comprising a gusset fold and therein unattached to said tubes in avoidance of embrittlement of said material at and adjacent two corners of the container.

JOHN S. STOKES

5/28

697

Plaintiff's Exhibit 6.

July 28, 1937

Transparent-Wrap Machine Corporation,
313 Hudson Street,
New York City.

Gentlemen:

The writer has recently reviewed a number of the Ivers-Lee patents and it is very evident that by means of method patents they have endeavored to fortify for themselves the use of various forms of package consisting of two or more 698
separate leaves of plastic covering and other materials.

In a similar way we think we should endeavor to further fortify the use of a package such as is made on the Transwrap Packaging Machine, and we suggest that either you or we, or both in cooperation with each other, should apply for some method patents covering various forms of package as might be made on the Transwrap Packaging Machine.

All of these would be based on a tubular package structure formed from a single web of material and sealed at both ends either by pressure or heat or both, and sealed along the longitudinal seam either by heat or pressure or 699
both, and might have any one of the following variations:

1. A package formed from a web of paper or other fabric or sheet material on which has been imprinted at the points to be sealed a plastic coating. Thus by this method a package may be made of kraft paper in the Transwrap Packaging Machine.

2. In order to strengthen the longitudinal seam of the package, the interlocking of the folds for the longitudinal seam so that one fold enters into the other before the heat sealing operation, and the strengthening of the end seal o

700 *Plaintiff's Exhibit 6*

the package by having some of the corrugations of the end seal running in one direction and some in another. It may be difficult to prove invention on this point but it is worth trying. So far as we can find, it has never been done nor suggested.

3. The combination of methods of making the package with various forms of filling devices including the method of manufacturing the package whereby when the package is made the tube is either horizontal or nearly so rather than vertical as in the present machine. This to accomplish
701 the more ready sliding into the package of the various articles.

4. While probably the claims as previously suggested would cover it, we should make sure that the form of package is covered for materials with such trade names as Cellophane, Sylphwrap, Pliofilm, Koroseal, Protectoid, and opaque krafts, parchments and sulphite and kraft papers, coated all over or in part with suitable heat or pressure sealing materials.

5. A package may be made of a web previously made
702 up of an opaque paper and a strip of cellophane, and when made into a tube becomes a Transwrap package having a strip of transparent material in front and a heavier opaque paper for the back of the package. This is similar to what is called a "Revelation Bag."

Mr. Zwoyer may have other suggestions to add to this list, but we believe we should proceed to at least get on record with the patent attorney the various possible ideas which might form the basis of future packages.

Very truly yours,

STOKES & SMITH CO.

D.E.Maxfield:IB

Plaintiff's Exhibit 6 703

P.S. In addition, the use of an inert gas flowed down through the filling tube while the package is being filled might be a patent which we could secure in connection with this package even though it is probable that Liquid Carbonic Co. has the broader patents covering this matter of introducing the gas, usually CO_2 gas or a nitrogen gas.

S. & S. Co.

Plaintiff's Exhibit 7. 704

October 29, 1937

Transparent-Wrap Machine Corporation,
313-321 Hudson St.,
New York City.

Attention: Mr. W. R. Zwoyer

Dear Mr. Zwoyer:

May we again remind you of the matter of patent protection for the Photo-electric cell registry device? 705

We believe that an effort should be made to take out a patent on this device, and because it was developed by you, it would seem more in order for you to take action regarding the patent than for us to do it.

Furthermore, there is a limit as to the time in which application may be effectively made after the device has been put in public use, and, therefore, application should be made within two years of that time.

Very truly yours,

STOKES & SMITH CO.

D. E. Maxfield:IB

Sgd. D. E. Maxfield

706

Plaintiff's Exhibit 8.

TRANSPARENT-WRAP MACHINE CORPORATION
313-321 Hudson Street
New York, N. Y.

September 1, 1939

The Stokes & Smith Co.
Summerdale Ave. near Roosevelt Blvd.
707 Philadelphia, Pa.

Attention: Mr. J. S. Stokes

Dear Mr. Stokes:

Referring to your letter of August 24th, we beg leave to say that whereas the matter of a time limit was not discussed during the conference between Mr. Stokes and the writer on the subject of royalty revision, the omission was due entirely to an oversight. The fact is that the directors of the Transparent-Wrap Machine Corporation in their
708 discussions expressed the view that the proposed downward revision should be granted for a period of one year only instead of the two years specified on the assumption that your experimental work and resultant expense in perfecting the Transparent-Wrap machine will have been concluded within that time. Our understanding is that your request for a lower royalty basis is predicated upon your claim that experimental work involves considerable cost. Whereas we do not question your word, it seems inconceivable that such experimental work need go on indefinitely and therefore feel that a two year time limit on the pro-

posed reduction is equitable. At the end of two years we can again discuss the matter if warranted.

While on the subject of expense, we believe it to be appropriate to call to mind that our Mr. W. R. Zwoyer on more than one occasion stated to Mr. Stokes that in his—Mr. Zwoyer's—opinion, based upon personal observation, experimental work is unreasonably costly due to operating methods in your plant. We consider Mr. Zwoyer well qualified to evaluate such matters and therefore are guided by his findings.

As to the proposed reduction, permit us to point out 710
that prior to entering into the license agreement with your good selves, several other machine manufacturers had approached us and offered royalties considerably higher than those now proposed. Whereas the firms we have in mind were likewise substantial, we concluded to enter into arrangements with you because of your high standing and qualifications not only, but also for the reason that you are specialists in the manufacture of mechanical filling devices. Throughout our dealings, we have striven to be liberal and in stipulating the two year limit to which you object, we are not varying from that course and therefore trust that 711
upon further consideration our offer will be accepted as it stands. In that expectation we return herewith the modification forms.

Sincerely

WILLIAM F. HEIDE (signed)
President
TRANSPARENT-WRAP
MACHINE CORPORATION

WFH:en

712 **Plaintiff's Exhibit 10.**

November 6, 1945

EXPERIMENTAL EXPENSE
ON TRANSWRAP MACHINES

1937 Year

		Total
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$434.75
TR-10	Engineering Expense	$1468.82

713

1938 Year

		Total
TR-13	Experimental Expense Transwrap	$1075.84
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$1081.30
TR-10	Engineering Expense	$2001.10

1939 Year

		Total
TR-13	Shop Work on Transwrap	$1320.02
3014	Shop Work Developing Pliofilm Liquid Holding Package	$ 582.22
714 TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 706.38
TR-10	Engineering Expense	$1415.48

1940 Year

		Total
3014	Liquid Holding Package	$ 508.96
TR-13	Experimental Transwrap	$1608.19
TR-17	Experimental Transwrap Filling Co.	$ 162.35
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 947.03
TR-10	Engineering Expense	$2825.45

Plaintiff's Exhibit 10

715

1941 Year

		Total
3014	Pliofilm Liquid Holding Package	$ 659.06
TR-3004	Vacuumizing Transwrap	$ 11.23
TR-13	Transwrap	$ 808.24
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$1121.05
TR-10	Engineering Expense	$1747.00

1942 Year

716

		Total
3298	Eng. Transwrap for Foil and Adhesive Webs	$ 218.75
TR-13	Misc. Transwrap	$ 359.63
3300	Shop Transwrap for Foil and Other Webs	$ 84.61
3301	Assembling Transwrap For Foil and Other Webs	$ 251.94
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 954.59
TR-10	Engineering Expense	$ 610.90

1943 Year

717

		Total
3298	Eng. Transwrap For Foil and Other Webs	$ 559.76
3299	Patt. Transwrap For Foil and Other Webs	$ 102.67
3300	Shop Transwrap For Foil and Other Webs	$ 980.10
3301	Assbly. Transwrap For Foil and Other Webs	$ 35.34
TR-13	Misc. Transwrap	$ 3.04
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 494.36
TR-10	Engineering Expense	$1972.79

718 *Plaintiff's Exhibit 10*

1944 Year

		Total
3354	Foot Operating Sealing Device	$ 177.53
TR-13	Misc. Transwrap	$ 111.27
3301	Assembly on Transwrap For Foil	$ 39.91
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$1297.93
TR-10	Engineering Expense	$3289.10

719 *1945 Year*

		Total
TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 758.76
TR-10	Engineering Expense	$2529.02

SUMMARY OF ITEMS 1937 TO 1945 INCLUSIVE

TR-9	Material and Labor in connection with demonstration and sample packaging at Summerdale	$ 7796.15
TR-10	Engineering Expense	$17859.66
720 TR-13	Experimental Expense Transwrap	$ 5286.23
TR-17	Experimental Transwrap Filling CO_2	$ 162.35
3014	Pliofilm Liquid Holding Pkg.	$ 1750.24
TR-3004	Vacuumizing Transwrap	$ 11.23
3298 to 3301 Inclusive	Engineering Transwrap For Foil and Other Webs	$ 2273.08
3354	Foot Operating Sealing Device	$ 177.53
	GRAND TOTAL	$35,316.47

721

Plaintiff's Exhibit 11.

TRANSWRAP ADVERTISING CHARGES

(including shows).

1937	1,926.54
1938	714.90
1939	1,379.95
1940	1,392.77
1941	2,049.38
1942	600.80
1943	413.22
1944	1,952.36
TOTAL	10,429.92

722

723

724

Plaintiff's Exhibit 12.

PATENT EXPENSES—TRANSWRAP

Case SS-3713	$ 623.25
" SS-3714	482.82
" SS-3715	641.52
" SS-3719	1,467.35
" SS-3721	302.26
725 " SS-381	1,797.45
" SS-391	862.15
" SS-392	174.94
" SS-394	225.33
" SS-399	1,025.75
" SS-3910	1,027.13
" SS-3911	945.40
" SS-3915	262.88
" SS-3916	667.62
726 " SS-4001	651.56
" SS-4003	534.75
TOTAL	11,692.16

Defendant's Exhibit A-1.

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 1

Fig. 1.

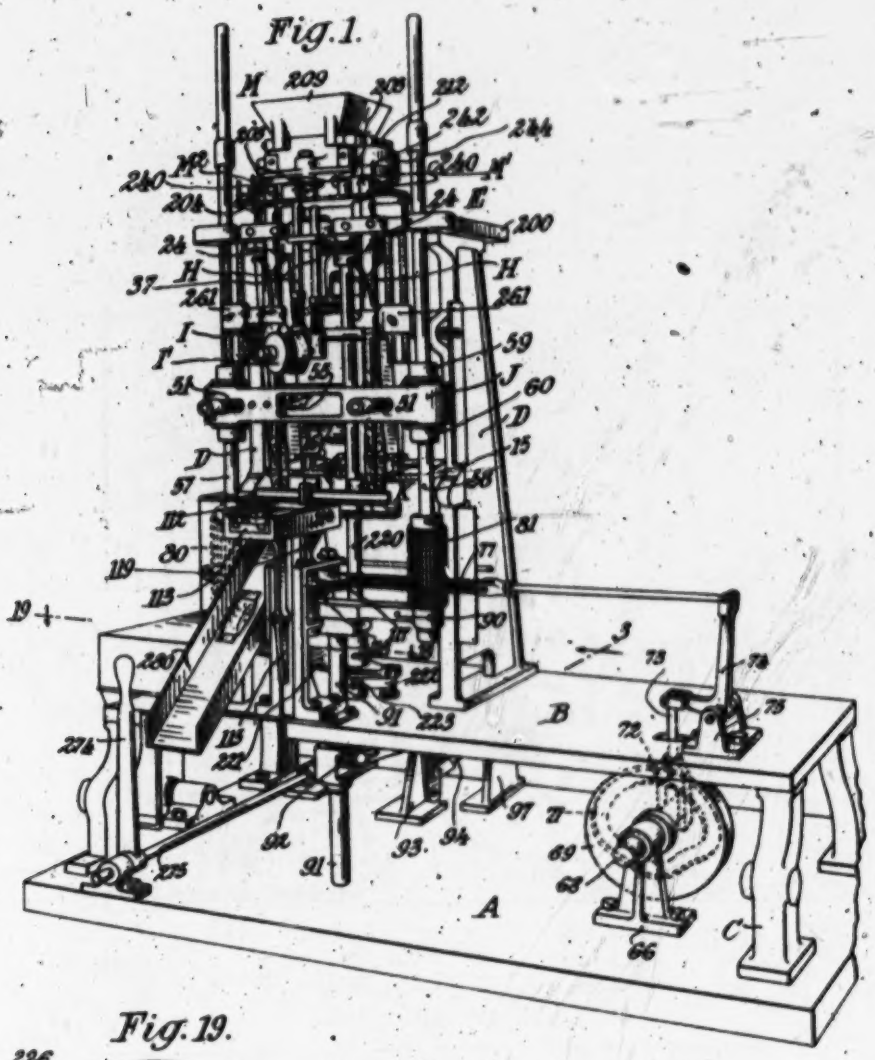
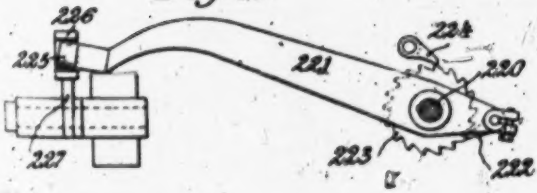


Fig. 19.



INVENTOR
Walter R. Zwoyer.
BY
Fraser Myers & Manby
ATTORNEYS.

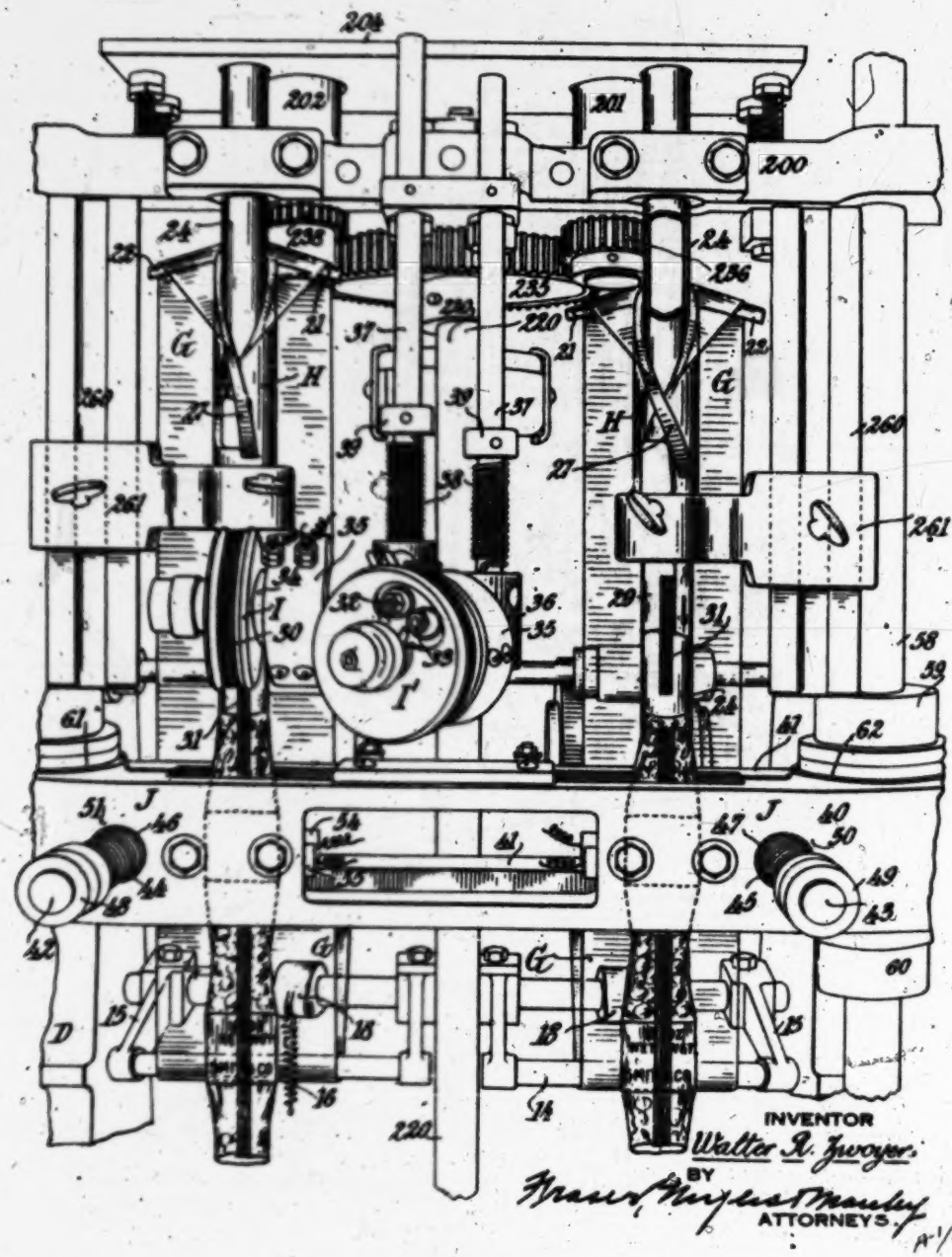
Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 2

Fig. 2.



Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 3

Fig. 3.

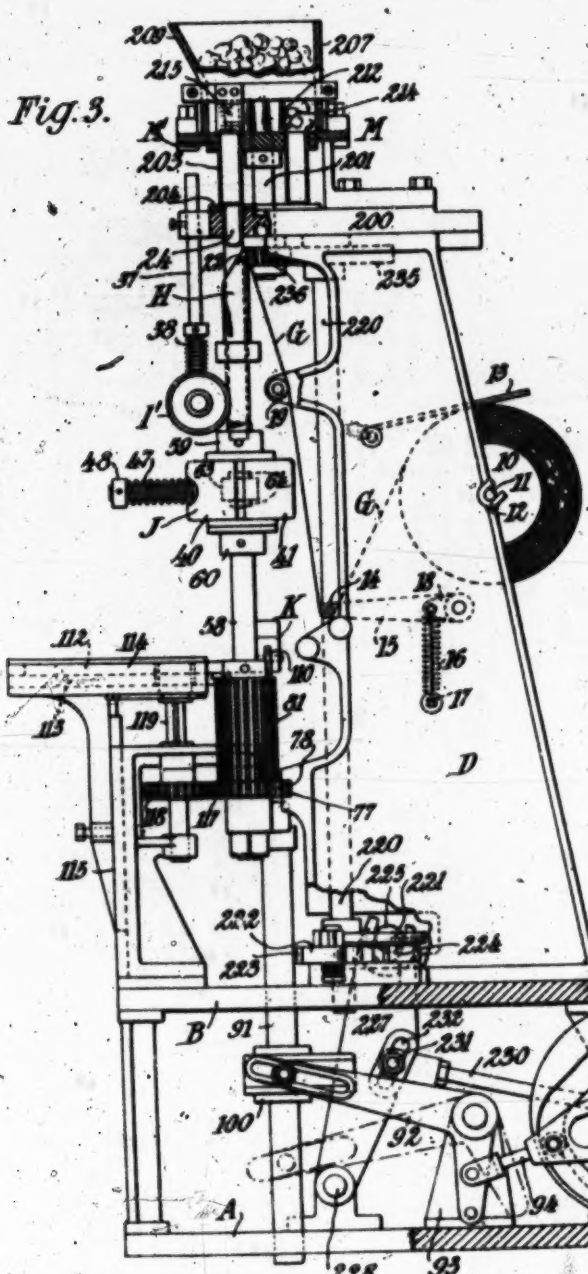
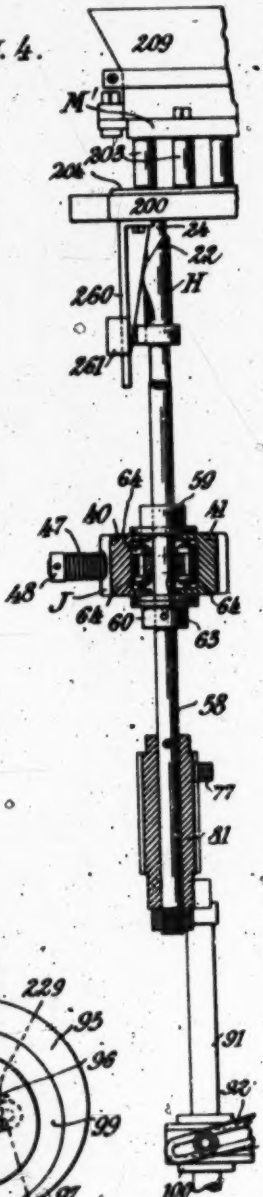


Fig. 4.



INVENTOR

Walter R. Zwoyer

BY

ATTORNEYS.

A-1/3

Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 4

Fig. 5.

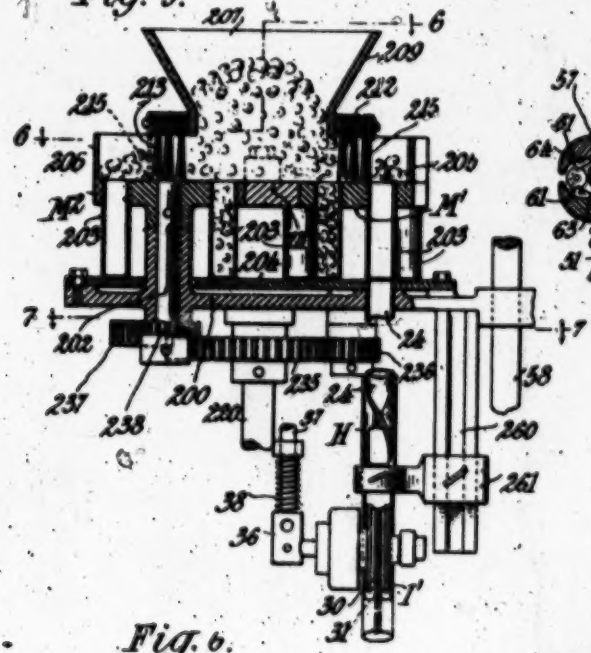


Fig. 8.

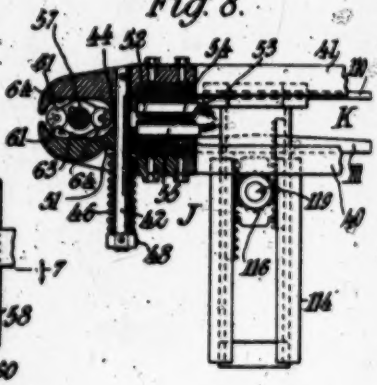


Fig. 6.

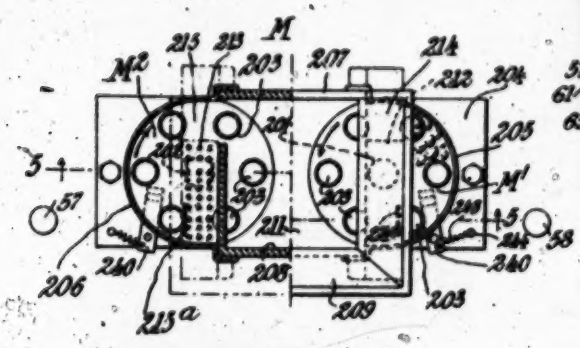


Fig. 9.

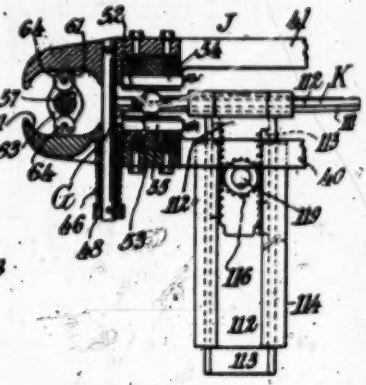


Fig. 7.

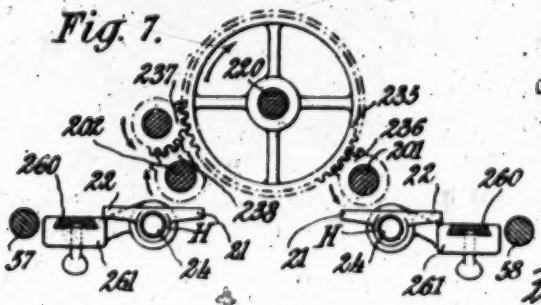
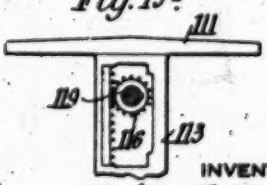


Fig. 15a



INVENTOR
Walter R. Zwoyer,
BY
Fraser, Hyett & Manley
ATTORNEYS.

Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 5

Fig. 10.

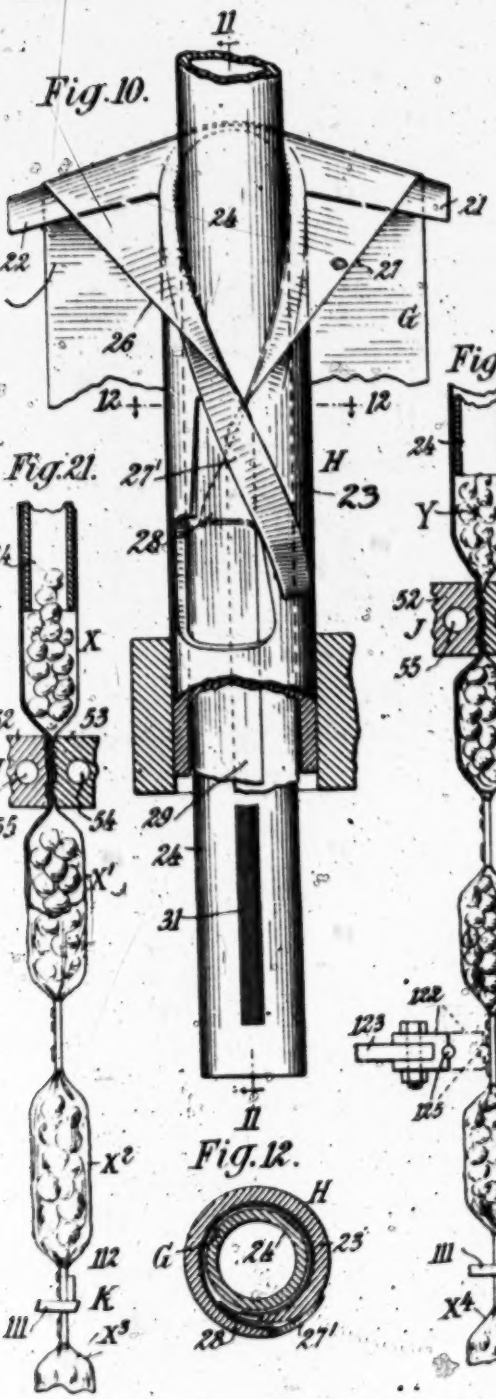


Fig. 11.

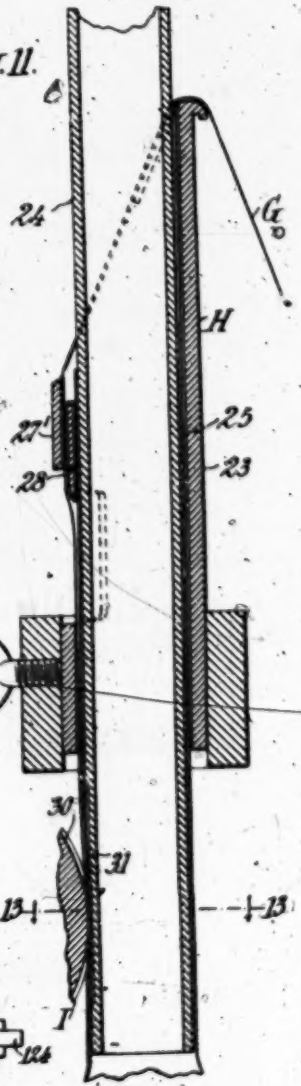


Fig. 20.

Fig. 21.

Fig. 12.

Fig. 13.

INVENTOR

Walter R. Zwoyer

BY

Fraser, Myers & Manley

ATTORNEYS.

A 1/5

Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 6

Fig. 14.

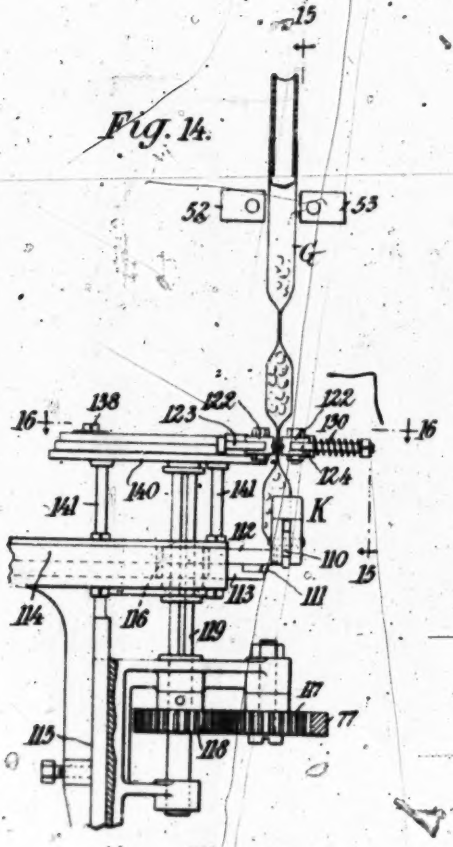


Fig. 15.

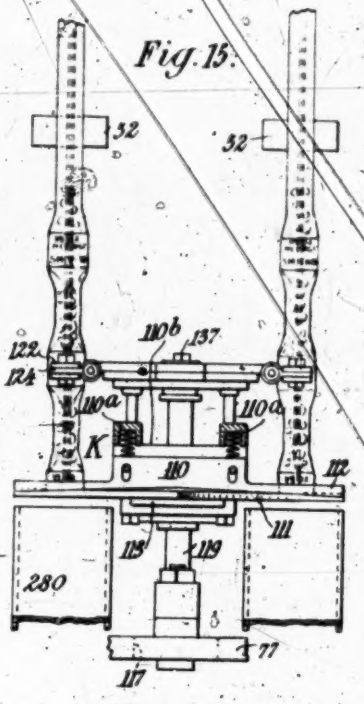


Fig. 16.

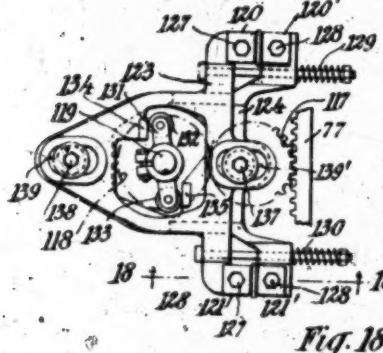


Fig. 17.

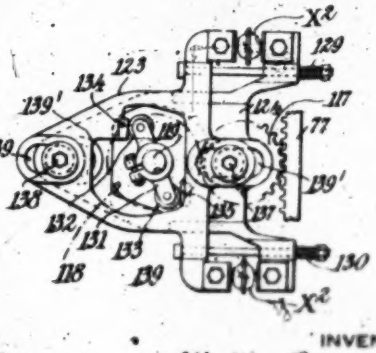


Fig. 18.

INVENTOR

Walter R. Zwoyer,

Fraser, Myers & Stanley

ATTORNEYS

Defendant's Exhibit A-1

Jan. 1, 1935. W. R. ZWOYER 1,986,422

AUTOMATIC PACKAGING MACHINE

Filed Nov. 28, 1933 7 Sheets-Sheet 7

Fig. 22.

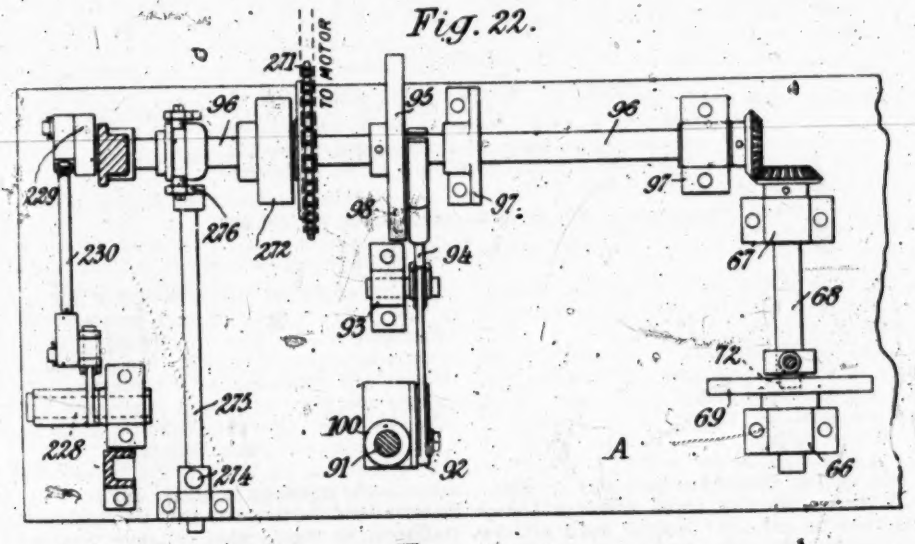


Fig. 23.

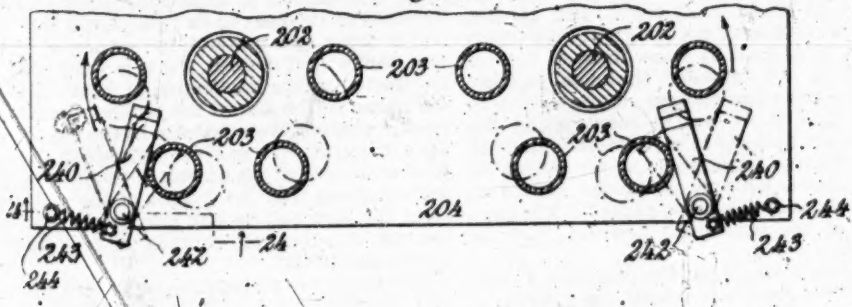


Fig. 24.

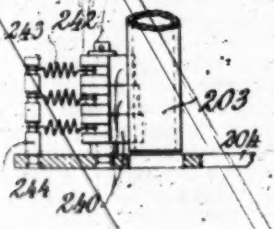


Fig. 25.

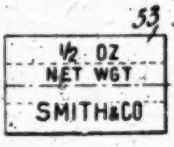


Fig. 26.

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Defendant's Exhibit A-1

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1,986,422

AUTOMATIC PACKAGING MACHINE

Walter R. Zwayer, Maywood, N. J., assignor, by mesne assignments, to Transparent-Wrap Machine Corporation, New York, N. Y., a corporation of New York

Application November 28, 1933, Serial No. 700,697

20 Claims. (Cl. 93—8)

This invention relates to an automatic packaging machine and aims to provide certain improvements therein.

The invention is particularly directed to the packaging of one or more small articles, such as pieces of candy either singly or in bulk. It is, however, adapted for use in the packaging of any articles of suitable size. It finds its greatest field of usefulness in connection with articles which can be fed either mechanically or automatically, and preferably those which will successfully feed by gravity. Among such articles may be enumerated candy of all kinds, dry medicines, particularly in tablet or pill form, various staples such as sugar, salt, coffee, tea, cereals, etc., and other articles of not too great bulk which it is desired to protect by some form of flexible package. It is not intended that the package shall follow closely the contour of the article to be packed; that is to say, in constructing the container of the package it is preferably made in some conventional form, such as an oblong or square receptacle, without particular regard to the contour of the article being packed. The general shape of the container, however, may be varied at will.

In proceeding to carry out the invention I form a series of containers into which the articles to be packaged are fed. These containers are not necessarily entirely closed but should be sufficiently so to prevent the escape of the contents after the feeding operation and before the completion of the packaging operation. More specifically the method comprises the formation from a strip of packaging material of what may be called a partially completed bag. The bottom of the bag while still attached to the strip is closed (or substantially so to prevent escape of the article to be fed), whereupon the article or articles to be fed are passed into the partly completed bag, usually by gravity, and in a measured quantity. The bag is then sealed at the top and simultaneously (or shortly thereafter) detached from the strip and delivered out of the machine.

In accordance with the preferred form of the invention packaging material is drawn from a reel and passed over a former by which it is bent to a tubular shape and, if desired, the meeting side edges are sealed so as to form a complete tubular portion several times the length of the package. The bottom of this tubular portion is sealed; the article to be packed is dropped through the entire tube to its bottom; the top of the container is then sealed, preferably while it is still attached to the remainder of the tube; the filled container still attached is pulled down to the delivery position and severed from the remainder of the tube. Preferably the mechanism is so arranged that the sealing and pulling devices are combined, and preferably also the pulling operation is utilized to advance the strip over the tube former so that no other mechanism is required to form the tube.

The machine embodying the herein-disclosed invention is intended to utilize any suitable sheet material and particularly thin transparent material such as regenerated cellulose preferably of the moisture-proof type, or any similar moisture-proof transparent or semi-transparent material, hereinafter referred to as "packaging material"; and in using such material the sealing of the bottom, top, and, if desired, the side seam also, may be effected by the application of heat. Hence in the construction shown the sealing members are heated, preferably electrically, by the use of resistance material. It will be understood, however, that as to some of the aspects of the invention it is contemplated that the joining of the material to form the tube bottom and side seams shall be by the use of adhesives, or folds, or any other approved method.

It is feasible in some instances to feed the article into the receptacle as thus described either by hand or by hand-controlled mechanism, but it is preferable in most cases to feed it automatically in timed relationship to the formation of the container. By so doing a very considerable speed of operation is attained. The automatic feed will take different forms depending upon the material to be fed and the quantity. It may be either a quantity measuring device, or a weighing device, or a counting device. In most instances, however, the feeding mechanism is designed to feed a single article, such as a piece of candy, at a time, or if a quantity of small pieces is to be packaged in each container the feed mechanism is appropriately a quantity measuring device. In the form of the invention shown in the drawings the feed mechanism is designed to feed into each container a measured quantity of small candy articles such as chocolate-covered peanuts, candy drops, or other similar articles.

Referring to the drawings which are illustrative of one form of the invention,

Figure 1 is a perspective view showing principally the front of the machine at which are located the principal operative parts of the mechanism and the delivery chutes one of which has been omitted in order to reveal underlying structure.

Fig. 2 is a front elevation on an enlarged scale

illustrating the tube formers, the tubes, and several packages which are completed and about to be severed.

Fig. 3 is a side elevation looking to the left in Fig. 1 and showing the position of the reel of packaging material, a side view of the tube formers, and a part of the driving mechanism.

Fig. 4 is a detail of Fig. 3 showing the construction of the feeding mechanism and of the sealing mechanism for the tops and bottoms of the containers.

Fig. 5 is a vertical sectional view of the feeding mechanism and adjacent parts.

Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Fig. 7 is a section taken on the line 7—7 of Fig. 5.

Fig. 8 is a top view partly in horizontal section of the top and bottom sealing mechanism, the mechanism being shown closed around the container tube.

Fig. 9 is a view similar to Fig. 8 but showing the sealing mechanism open.

Fig. 10 is a front view partly in section of the tube former.

Fig. 11 is a central vertical section of Fig. 10 taken on the line 11—11 in Fig. 10.

Fig. 12 is a cross-section of the tube former taken on the line 12—12 in Fig. 10.

Fig. 13 is a cross-section taken on the line 13—13 of Fig. 11.

Fig. 14 is an elevation of a detail showing the operation of the cutting mechanism and also the gripping mechanism above the cutting mechanism.

Fig. 15 is a view taken at right-angles to Fig. 14, certain parts being shown in section.

Fig. 15a is a detail view of the lower cutting knife.

Fig. 16 is a top view of the gripping mechanism of Fig. 14 taken on the line 16—16 in that figure, the cutting knives being omitted.

Fig. 17 is a view similar to Fig. 16 with the grippers shown in open position.

Fig. 18 is a section taken on the line 18—18 in Fig. 16.

Fig. 19 is a detail taken in horizontal section approximately on the line 19—19 in Fig. 1.

Fig. 20 is a view showing the progressive formation of the containers and their several positions with regard to the sealing clamp, gripping mechanism, and cutting mechanism when the gripping mechanism is used.

Fig. 21 is a view similar to Fig. 20 showing the positions when the gripping mechanism is omitted.

Fig. 22 is a horizontal section showing the main driving connections.

Fig. 23 is a horizontal sectional view taken through the feed mechanism and showing the vibrators.

Fig. 24 is a detail of the vibrators.

Fig. 25 is a face view of one of the dies used in the sealing operation.

Fig. 26 is an end view of the two dies, the showing being fragmentary.

Referring to Figs. 1 and 3 of the drawings, it will be understood that the structure generally is built upon a framework in which A is a suitable base-plate, B is a table mounted upon legs C so as to be spaced apart from the base-plate. D, D are standards constituting side frames, which standards are mounted upon the table B. At the top of the standards is carried a platform E which supports the feed mechanism and various other parts of the machine. The structural framework thus formed may be varied at will so long as the operative parts are properly supported.

The machine shown in the drawings is a duplex machine. That is to say, it is designed to simultaneously operate to produce two series of packages. In other words, in the operation of the machine two container tubes are constantly being made, filled, severed and delivered. Any suitable number of tubes may be thus simultaneously produced, but I prefer the duplex type since it enables me to take advantage of a single operating mechanism for actuating each of two like parts, and thus obtains simplicity while at the same time the output of the machine is doubled as compared with a single type.

Referring first to Fig. 3, it will be observed that at the rear of the machine is a reel 10 mounted on a spindle 11 which fits in grooves 12 formed on the side frames D. On this reel 10 is indicated as being wound a long strip of packaging material of a width which is suitable to form the complete container. Pivoted to rest on the top of the roll of material is a steadying weight 13 which prevents overrunning of the reel. There is a similar roll of packaging material on the opposite side of the machine.

The strip of packaging material G is led down over a tension roll 14 mounted on a pair of arms 15 which are given a proper tension by a spring 16, one end of which is attached to a fixed point 17 of the frame, and the other end of which is attached to a short lug 18 on a rock shaft which connects the arms 15. The strip G then passes with a slight bend over a fixed roll 19 and thence to the former H.

Turning now to Figs. 10 to 13, it will be seen that the former is provided with a pair of arms 21 and 22. In Fig. 10 the strip G is shown as passing up at the rear of the former, then over the arms 21, 22, and then sharply down, over the upper edge of, and into the outer former tube 23. The center of the strip passes down at the rear of the inner former tube 24 (which inner tube also forms a feed tube for the articles to be packaged), the position of the center of the strip being indicated at 25 in Fig. 11. The edges of the strip are led downwardly and crossed one inside the other, as best shown in Fig. 10. In this figure the edge 26 is shown as being led to the right by a former guide strip 27', while the edge 27 is shown as being led to the left by a former guide strip 28. Any suitable type of former may be used, it being sufficient that it be such as to form the strip into a tube-like structure, preferably with one edge overlapping the other, as indicated at 29 in the lower part of Fig. 10. It will be observed that so long as the tube portion thus formed is pulled downwardly the former will continue to develop the strip into a tube.

Having thus formed the strip G continuously into a tube, it is desirable in some cases to seal the edges of the tube together. Where the packaging is of a single, relatively small article, however, the lapping of the edges of the strip together with the closing of the ends of the container, which is finally accomplished, is sufficient to protect the article from dust, dirt, and even to an extent to exclude the atmosphere. In packaging a group or number of articles, however, which are movable within the container, it is very desirable to seal the latter along the edges. This may be done very easily in the case of regenerated cellulose or similar packaging

material by the use of a heated wheel such as is shown at I (or I') in Fig. 2. This wheel is preferably provided with an ordinary resistance wire through which is fed a current which is suitably proportioned to maintain the periphery of the wheel at proper sealing temperature. Preferably the periphery is formed with circumferential ribs or ridges such as 30 which indent the packaging material. The lower part of the inner forming tube 24 may be formed with grooves 31 matching such ridges, as best shown at the right in Fig. 2. Indentations are thus formed in the side seam of the tube whereby the sealing of the latter is facilitated. The electrical line connections to the sealing wheels I, I' are not shown, but the terminals are indicated at 32 and 33.

It should be noted that each of the sealing wheels I and I' is mounted upon an axle 34, supported in an electric terminal box 35, connected to a rotatable hub 36, mounted to turn upon a fixed shaft 37. A spring 38 encircles the shaft 37, one end of the spring being connected with the hub 36 and the other with the shaft 37 through the medium of a collar 39. This spring is placed under tension, with the result that the sealing wheel is yieldingly urged against the partly completed tube of packaging material so that it exerts a definite pressure against the side edges of the latter as before described. The spring being adjustable by displacing the collar 39 angularly, the exact degree of pressure which is desirable for the best sealing results can be easily attained.

It should also be noted that this mounting of the sealing wheels permits the entire sealing wheel to be swung around to the position of the wheel I' in Fig. 2, thus permitting the tube of packaging material to be inspected or rearranged or removed in case of accident or disturbance. In Fig. 2 the sealing wheel I at the left of the machine is shown in operative position.

The tube of packaging material being thus formed either with or without side sealing, is drawn down below the end of the inner former tube 24, the extreme lower end of the tube being now ready to be closed to form the bottom of the container. As soon as the container tube is closed, or partially so, the package is in condition to receive its contents. It is of course not strictly necessary at this point that the end seal of the package be fully completed. It is only necessary that the ends be closed toward each other sufficiently to prevent the contents from dropping out of the bottom of the package. Preferably, however, the machine is so organized as to close the part of the tube which has been drawn through the former and either wholly or partly complete the seal before the introduction of the contents.

The mechanism for forming the end closure of a package which may serve as its bottom may be of various forms, but I prefer that illustrated. It comprises generally a clamping mechanism which is shown generally at J, such clamping mechanism, if packaging material appropriate for heat sealing is used, comprising a pair of clamps provided with heated sealing dies which are designed to be brought together to embrace the container, while it is still attached to the body of the tube, at a position near the lower end of the inner forming tube 24, this position being illustrated in front elevation in Fig. 2, in side elevation in Fig. 3 and in vertical section in Fig. 4. Preferably it comprises a front bar 40 and a rear bar 41, the rear bar carrying a pair of elongated studs 42, 43 which pass through holes 44, 45 in the front bar, springs 46, 47 encircling the studs and being confined between nuts 48, 49 at the ends of the studs and shoulders formed on the front bar around the holes 44, 45 as indicated by the reference numerals 50, 51. The effect of the springs is hence normally to draw the bars toward each other with an adjustable force designed to produce the proper compression of the bars over the container tubes. It will be observed from Figs. 8 and 9 that each of the bars carries a pair of heating dies 52, 53 which are screwed to the bars, each element being bored to admit an electric heater 54, 55.

The bars 40, 41 are mounted upon rods 57, 58 (see Fig. 1) and are permitted to move toward and away from each other by the expedient of holding them between flanged collars 59, 60 which are fixed on the rods 57 or 58 (see Fig. 4). For this purpose the ends of the bars are provided with curved bearing faces which are best indicated in Fig. 8 at 61, 62. The tension on the springs 46, 47 is sufficient to hold the bars in place and permit them to approach and recede from each other without escaping from the collars 59, 60. This construction also permits the rods 57, 58 to be rotated without disturbing the clamping mechanism, thus enabling these rods to be used as shafts for purposes to be described.

The mechanism for opening and closing the clamping bars is best illustrated in Figs. 4, 8 and 9. As shown in these figures the curved interiors of the ends of the bars are hollowed so as to contain a double-armed cam lever 63, which cam lever is keyed to the shaft 57. The cam lever preferably carries at each end a cam roller 64 for antifriction purposes, which cam roller bears against the hollow interior cam surfaces of the clamping bars to open the same and to guide their closing upon rotation of the shaft 57. Fig. 4 shows the position of the cam lever 63 when the clamps are separated, as does also Fig. 9. The closed position of the clamps, corresponding to the position of the heater elements when the bottom of the tube is being sealed, is shown in Fig. 8.

The mechanism for opening and closing the clamps through the oscillation of the shafts 57, 58 is best seen in Figs. 1, 3 and 22. Referring to these figures it will be seen that the base A of the machine is provided with bearing standards 66, 67 adapted to form journals for a cam shaft 68 carrying a rotary cam 69. Cam shaft 68 is driven in any suitable manner in timed relationship to the remainder of the machine. The cam 69 is provided with a cam track 71, shown in dotted lines in Fig. 1, in which cam track is mounted a cam roller 72 connected by a pitman 73 to the short arm of a bell-crank lever mounted in a bearing 75 on the table B. The cam movement is such as to reciprocate the pitman 73 in a vertical direction, which movement, being translated by the bell-crank lever, insures a horizontal reciprocation of an elongated rack 77. This rack 77, which is best seen in Fig. 1, extends across the front of the machine, being held in suitable guide recesses 78, as shown in Fig. 3. Each of the shafts 57, 58 has fixed to it an elongated gear 80 or 81, which two gears mesh with the rack 77 so that upon reciprocation of the latter the shafts 57, 58 will be oscillated approximately a quarter of a turn in each direction. This angular movement of the shafts insures the displacement of the cam lever 63 to approximately ninety degrees from the position of Fig. 8 to the position of Fig. 9, thus opening the clamp bars J at the end of each sealing movement of the latter.

Hitherto the clamp J and associated mecha-

nism have been described as a means for effecting a tube closure adapted to serve as the bottom of a receptacle. After the articles to be packed have been inserted in the receptacle, it of course becomes necessary to make some kind of a closure at the top. The invention contemplates any suitable means for accomplishing this result, but by far the simplest mechanism is that illustrated in the present drawings wherein the clamp operates not only as a bottom sealer but also as a top sealer. When using packaging material appropriate for heat sealing it is can be accomplished by so proportioning the vertical widths of the sealing dies 52 and 53 that they will seal a portion of the tube of sufficient breadth to enable the filled container to be severed from the tube across the sealed portion, thus leaving the top of the undertube sealed and forming a sealed bottom for the next succeeding tube above. The widths of the sealing dies are well illustrated in Fig. 20, and this figure will be referred to later in connection with the explanation of the timing of the machine and general method of operation.

It has heretofore been said that the mere pulling of the container tubes downwardly through the former is sufficient to continue the formation of the tubes. This operation of pulling down the tubes to bring a new tube section into filling position after a section below has been filled and sealed, may be accomplished by any suitable mechanism. I prefer, however, the mechanism shown in the drawings in which the clamps J constitute the pulling mechanism so that no separate mechanism is required for this purpose. This has the additional advantage that it enables the sealing dies 52, 53 to remain in contact with the container tube for a longer time than would be feasible if these dies merely closed to seal the tube and opened to let the tube pass.

This particular object is accomplished by reciprocating the clamp J vertically, so that after it has clamped the container tubes when in its uppermost position it will pull them down to an extent which brings those portions of the container tubes above the clamps to a position ready to receive a fresh charge of contents, thus sealing the top of the lower tube and the bottom of the upper tube. After this feed motion of the clamp, the cam levers 63 come into play to open the clamp whereupon the clamp rises to its upper position and the sequence is repeated.

A suitable mechanism for accomplishing this motion is shown best in Fig. 1. In this mechanism the two rods or shafts 57, 58 are mounted at their ends in a crosshead 90 in which said shafts are journaled, and this crosshead in turn is mounted on the top of a reciprocating bar 91 which passes through and has a bearing in the table B and also in the base A. The bar 91 is given a vertical reciprocation by a bell-crank lever 92 oscillating in bearings 93 and actuated by a pitman 94, which in turn is operated by a cam 95 having a shaft 96 which turns in bearings 97, as seen in Figs. 3, 4 and 22. The cam is provided with the usual cam roller 98 running in customary cam track 99. The shaft 96 may be driven in suitable timed relationship to the remainder of the machine.

It will be noted that irrespective of the position of the crosshead 90 the shafts 57 and 58 still remain in operable relation with the rack 77, this being due to the elongated gears 80 and 81 which mesh with the rack in any position of the crosshead. This of course insures the proper operation of the clamp in closing at the top of its movement; remaining closed during its descent; opening at the bottom of its movement; and remaining open until the clamp again reaches the top preparatory to a successive clamping action.

It will be apparent that the opening and closing movement of the clamp may be adjusted either by changing the cam 71, or the length of either of the arms of the bell-crank lever 74. The upper and lower positions of the clamp may be adjusted either by changing the position of the collar 100 on which the bell-crank lever 92 operates, or by changing the cam bell-crank lever, or the point of application of the pitman 94 to the bell-crank lever.

The machine as thus far described would produce a connected series of pockets filled with the articles to be packaged, and for some purposes the machine will be operated in this way. Some articles such as tablets, pills or the like are best purveyed in a long strip, each tablet for instance being separated from its fellows by a sealed section. The machine can also be operated in connection with the production of individual packages by severing the packages by hand. My invention, however, provides an improved severing mechanism particularly coordinated with the remainder of the machine so that the complete machine is quite automatic in its character.

Referring now to Fig. 20 which shows the preferred course of the packaging operation from the point of formation of the tube of packaging material down to the completely filled and individually separated package, it will be seen that this figure illustrates a portion of the tubular strip G surrounding the inner tube 24 of the former. Fragmentary portions of the end sealers 52, 53 are also illustrated. Fig. 20 represents that point in the operation where the end sealers have been brought together to seal the bottom of a new package X which is just being formed, the contents Y having been delivered through the tube 24 into the package. The next previously formed package X' is also at this point being sealed by the elements 52, 53; the next previously formed packages X^2 and X^3 are still connected with the line of containers; and the knife mechanism K is shown as just severing a still lower package X^4. It is obvious that it is within the purview of the invention to locate the knives at a central part of the sealers and sever the package X' at the same time it is being sealed at the top; it is also within the purview of the invention to sever the package X^2 by application of the knives between the packages X' and X^2. It is preferred, however, in the case of very small packages to sever that package which is in the position of X^4.

Referring now to Figs. 1 and 3, the general location of the cutting knives is indicated by the reference letter K. Details of the cutting mechanism are best illustrated in Figs. 9, 14 and 15. In these figures the upper knife is indicated by the reference numeral 110 and the lower knife by the numeral 111. The lower knife (as best seen in Fig. 15c is somewhat angularly formed so that as it passes under the upper knife it will have a slight shearing action. The upper knife is also given a slight V-shape (as best seen in Fig. 15) but at right-angles to the lower knife, so that the upper knife in fact rises during the cutting stroke against the tension of springs 110a suitably housed in the upper knife carrier 110b. The operating mechanism for the knives is connected with them at their middles and the two

projecting [illegible] are designed to cut the two packages. One such package is shown being cut in Fig. 20. Any suitable operating mechanism may be employed, but that illustrated comprises a pair of rack slides 112, 113, which are carried in a slide box 114 fastened to a bracket 115, as best seen in Fig. 1. Each of the racks is moved by a pinion 116, as best seen in Figs. 8 and 9, this pinion being located between the racks and operating to move the knives in opposite directions to separate them to permit the down feed of the filled packages between them and to close them to sever the packages. The driving mechanism for the knives is best seen in Figs. 1, 3 and 14. The rack 77 which drives the sealing clamps is utilized to transmit motion to the pinion 117, which in turn meshes with a similar pinion 118, to which is fixed a shaft 119 carrying the pinion 116 midway of its length, as shown in dotted lines in Fig. 14 and in plan in Figs. 8 and 9. The proportions of the gears are so designed that the reciprocations of the rack 77 afford the necessary opening and closing movements of the knives, and these are best timed to close and sever the package simultaneously with the gripping of the tube of packaging material by the clamp J. In some instances it is desirable to introduce a steadying feature to the line of connected packages while they are being severed, and in Figs. 14 to 17 I have shown such a construction. This particular mechanism has been omitted from Figs. 1 and 3 for clearness.

The mechanism consists of a pair of clamps designed to grasp the line of unsevered packages at the point between the packages X^2, X^3 in Fig. 20. The two pairs of clamps are shown at 120 and 120' and at 121 and 121' in Fig. 16. They comprise merely yoke members 122 (see Fig. 18) which are designed to be bolted to clamp plates 123, 124 by bolts 127, 128, each of the yoke members carrying a packing such as a piece of rubber 125. These clamp plates are normally held together by two bolts 127a, 128a which pass completely through the sides of the clamp plates and are fitted with springs 129, 130, which normally tend to press the clamps together to an extent which can be adjusted by varying the pressure on the springs. To separate the clamps and hold them separated while the connected packages are passing between them, a cam lever 131 is provided which operates in a suitable aperture or recess formed in each of the clamp plates, the cam lever 131 having cam rollers 132, 133 which operate respectively on bearing faces 134 and 135 on the clamp plates 123 and 124. The two positions of the gripper clamp are illustrated in Figs. 16 and 17. In Fig. 16 the clamp is shown closed, and in Fig. 17 it is shown open.

Any suitable means for driving the clamp may be provided. In the construction shown the cam lever 131 is mounted directly on the upper end of the shaft 119 so that when this shaft is oscillated by the rack 77 (through gears 117, 118) the cam lever will be oscillated with it. The total movement of the cam lever in the construction shown is approximately 90°, but this full movement is not availed of in the operation of the cam lever. Fig. 17 shows the completion of its movement in an anti-clockwise direction to open the clamps, and Fig. 16 shows the completion of its effective movement in a clockwise direction to close the clamps, but from the position of Fig. 16 the cam lever continues its clockwise movement for approximately 70°. This latter movement is idle, as is also its return movement until it contacts with the bearing faces 134, 135. During this idle movement the clamps are closed. It is best to provide a limitation on the relative movements of the plates 123, 124, and this may be done by studs or bolts 137, 138 fixed to a stationary supporting plate 140, the cam plates having suitable slots 139, 139' through which the studs pass. The two clamp plates 123 and 124 are carried on the stationary plate 140 which is mounted on suitable standards 141, as best seen in Fig. 14.

It will be understood that this gripper clamp, by grasping the unsevered package assembly below the package X^2, adds a steadying effect to the package X^2 so that the knives can operate with more certainty.

Fig. 21 illustrates the operation when the gripper clamp is omitted. In this case the knives K sever the package X^2.

With the construction thus far described, it would of course be possible for an operator to drop the articles to be packed down through the tubes 24 by hand each time the end sealing clamps 52, 53 were operated. It would also be possible to adopt any suitable form of measuring or weighing device for introducing uniform quantities into the packaging tubes at the proper time.

I prefer, however, the automatic construction of feeding device illustrated in the accompanying drawings. In this construction a machine is provided with a platform 200 arranged on the upper ends of the side frames D (see Figs. 1 and 3). This platform serves as a supporting bearing for the shafts 57, 58, the inner former tubes 24, 24 (see Fig. 2) and the supporting rods 37, 37 for the side sealers I, I', as well as other parts of the mechanism.

Mounted on the top of the platform 200 is the feeding mechanism M now to be described.

It will be noted that the inner former tubes 24 (see Figs. 3, 5 and 6) are extended through the upper platform 200, and are open at their tops to form the feed passage for the materials leading to the container tube.

The feeding mechanism M in the duplex type of machine illustrated comprises in its preferred form two measuring and feeding disks M', M^2, which are shown in plan in Figure 6. A section taken on the line 5—5 in Figure 6 is shown in Figure 5. Each of the feeding disks M', M^2 is mounted to rotate in a horizontal plane, being fixed to the upper end of a shaft 201 or 202. These shafts are carried in bearings on the platform 200, the shafts being intermittently driven in a manner to be described. Each feed disk carries an appropriate number of feeding and measuring tubes 203, the lower ends of which extend closely adjacent to a feed table 204, which is stationary on the platform 200. The upper ends of the feeding and measuring tubes are also open, and partially surrounding them are rims 205, 206, which with side walls 207, 208 (see Fig. 6) constitute a box for the supply of articles to be fed. Over this box is arranged a funnel 209 designed to receive the articles from any suitable source. Normally, the container thus formed will be partly full of the articles to be fed. The upper sides of the disks M', M^2 are bridged by a stationary plate 211 (Fig. 6) so as to prevent the articles to be fed from falling downwardly around the disks.

Generally speaking, each of the tubes is de-

signed to be filled by the articles lying above them in the container 25 during its movement around its circular path, and when it reaches the discharge position over the tube 24 (see the right-hand portion of Fig. 5) it discharges its load by gravity into the tube 24.

With many small articles, such as certain types of candy, there is a tendency to clog the upper ends of the tubes 203, so that they either do not contain the full measured amount when they arrive at the discharge position, or fail entirely to discharge their contents, or both. This is probably due to the weight or pressure of the body of the materials to be fed which is present above the tubes in the feed box or hopper.

The present invention provides a novel feature in this type of feed mechanism, in that it acts to fill the tubes without pressure at the time of filling. In other words, after a tube is emptied by discharging its contents at the appropriate point the articles to be fed are permitted to pour into the tube without pressure. Preferably, each of the tubes is filled before it passes under the main body of the contents of the feed box. This is accomplished preferably by the construction shown wherein for each feed disk there is arranged a barrier in the form of a brush 212 or 213. This brush does not extend entirely across the feed disk, but is so proportioned that a space 214 or 215 is left between the end of the brush and the encircling rim 205 or 206. The bristles of the brush in each case extend close to the top of the disk, so as to hold back any material from the middle of the feed box on the delivery side, thus preventing any greater quantity being fed than is contained in the particular tube 203 which is in feeding position. This is rendered more positive by plates 214a, 215a.

By reference to Figures 5 and 6, it will be seen that the right-hand disk is in the position where one of its tubes 203 is in alignment with the tube 24 and this tube 203 has discharged its contents. The next succeeding tube 203 is fully loaded, so that at the next forward movement of the feed disk M' such succeeding tube is brought to the discharge position. In the meantime the feed tube which has previously been emptied has gone forward one step and begins to receive some of the loose candy which has worked through the space 214. This candy is under no pressure or weight to speak of, and drops easily down to the bottom of the tube. On the next movement of the feed disk the tube 203 is practically or completely filled so that when this tube moves around under the body of the material in the feed box or hopper it is already in a filled condition and cannot be clogged or choked in any way. At the same time the construction is such that no dangerous surplus of candy or other articles can pass through the space 214, the flow from the feed box or hopper being laterally outward along the top of the disk and being self-regulating if the space 214 is properly proportioned.

The two feed disks may be given proper intermittent motion designed to carry each tube 203 step by step over the feed pipe 24. That shown in the drawings comprises a main vertical shaft 220, which is shown in the central portion of Fig. 1 and which is best seen in Fig. 2. This shaft is driven at its bottom by a pawl lever 221, as is clearly shown in Fig. 19. This pawl lever is pivoted on the shaft, and carries at its extreme end a pawl 222, which acts upon a ratchet 223 fixed to the shaft to impart intermittent movements to the latter as the lever 221 oscillates. A pawl 224 is arranged on a fixed part of the machine, which pawl acts on the same ratchet wheel 223 and prevents reverse movement of the shaft during the idle movements of the pawl 222. The end 225 of the lever 221 enters a reciprocating yoke 226 mounted upon a rocking lever 227. This rocking lever 227 is clearly shown at the bottom of Figure 3, being pivoted to a stationary fulcrum 228, and being driven by a crank 229 mounted on the shaft 96 through the medium of a pitman 230 which connects the crank with an adjustable pivot 231 held in a slot 232 formed in the lever 227. Thus, on every rotation of the shaft 96 the feeder shaft 220 is given a forward angular movement, the movements of the shaft being intermittent. As will be best seen in Figure 2, these intermittent movements of the feeder shaft 220 are transmitted to the shafts 201 and 202 by a gear train which comprises a large gear 235 keyed to the feeder shaft 220 and meshing directly with a pinion 236 keyed to the lower end of the shaft 201 which operates the righ-hand feed disk M' and indirectly, through the medium of an idle gear 237, Fig. 7, with a pinion 238 connected to the shaft 202. This indirect connection is provided to reverse the rotation of the feed disk M², since I have found in practice that with a feed supply which is common to two individual disks, (such as is provided by the feed box and hopper), trouble is occasioned if the two feed disks rotate in the same direction, which trouble is avoided by reversing the direction of the disks.

It sometimes happens, in the feeding of particular articles such as chocolate-covered nuts or the like, that there is some adherence of the articles to the feed tubes 203, or a slight choking or jamming within these tubes. I have found that this can be obviated by striking one or more blows on the tube 203 when approximately in the feed position. In Figures 1, 23 and 24 I have shown a simple device for accomplishing this result. In these figures I have shown one or more strikers 240, which may be formed of wood or other suitable material. These strikers may be pivoted on a common stud 242 and are provided with springs 243, which may lead to a common pin 244. Being urged by the springs in a direction opposite to the direction of rotation of the feed disks and being of a length to engage the various feeding tubes 203, it will be seen that as the disks rotate they will be moved outwardly by one of the feeding tubes until they escape the tube, whereupon they will strike the next succeeding tube with a blow which is determined by the tension on the springs 243. By the simple expedient of making the strikers of varying length, the timing of the blows can be accurately adjusted. I have found that the best results are attained if the final blow is delivered just as the tube 203 arrives at discharge position. One or more additional blows can be given slightly before this position is reached.

In the construction of the machine as thus described, I have found it of value to provide various features which will now be referred to.

The sealing wheels I, I' (Fig. 3) being adapted for continued rotation in the same direction, are best supplied with electric current through the medium of slip ring connections the details of which are not shown, but which are housed in an electric terminal box 35, so as to swing with the wheel.

The end sealing dies 82, 83 may be configured by alternate grooves and ridges. I have found, however, that if there are distinct depressions in one

die and corresponding projections on the other die, a very strong seal can be made in the package. These depressions may be shallow, and may be of any desired shape. This discovery has permitted me to use the sealed end portion of a package as a suitable part in which to impress characters indicating the name of the manufacturer, the weight of the contents, or other legend. When this is done the seal is sufficiently strong that corrugations may be minimized or even omitted.

Figure 25 shows the face of a die embodying this construction, and Figure 26 shows an end view of the two dies. The depressions are indicated at 253 and the projections are indicated at 254.

Throughout the machine provisions are made for adequate adjustment of the parts, such as the brackets and slides 260, 261 (Fig. 2) for adjusting the position of the formers. These are for the most part ordinary expedients.

The machine is of course driven with all of its parts in timed relationship. I have already described the immediate mechanism for driving each part, but in Figure 22 I have shown the main motor connected by a chain to the sprocket wheel 271, which is connected by a suitable friction clutch 272 to the main drive shaft 96, which in turn drives shaft 68 by means of a bevel gear connection. The cam wheel 95 is mounted directly on the main drive shaft. The friction clutch 272 is operated by a hand lever on the front of the machine, indicated at 274, which turns the rock shaft 275, to which is connected a shift lever 276. The ultimate delivery of the packages out of the machine can be accomplished by any appropriate means such, for instance, as a pair of delivery chutes one of which, designated 280, is shown in Figure 1 and the other of which is omitted so as to reveal underlying structure.

It is believed that the operation of the machine is sufficiently indicated by the foregoing description, but briefly it is as follows:

The strip G of packaging material is led from its roll through its guides over the top of the former H, and is formed into a tube, the side or lengthwise seam being sealed by one of the rotary sealers I or I'. Assuming that the machine has progressed to the point where it is in full operation, the end sealing clamps 52, 53 may be taken to be in their upper position wherein they are commencing to seal the bottom of the partly formed container X (Fig. 20), which at the same time has been filled with a measured quantity of candy or the like by the discharge of the contents of one of the feed tubes 203 of the feed mechanism into the tube 24. Below the container X is a filled and sealed container X', and below that still another filled and sealed container X^2. Below that is a third filled and sealed container X^3, all of these being connected together by their sealed end portions. The grippers 122 are gripping the sealed portion between the containers X^3 and X^2, and the knives are operating to sever the container X^3 from the container X^2. The knives then retract, the grippers open, and the end sealer clamp pulls the whole assembly down a distance equal to the height of one container. This movement makes a new partly formed tube and completes the sealing operation, if that has not already been accomplished. The grippers then close about the sealed portion connecting containers X^1 and X^2 and hold the assembly firmly while the clamps are releasing the sealed portion between containers X and X^1 and are moving upwardly to their new position above the previously partly formed container X to complete the top seal thereof and the bottom seal of the newly formed container. The knives may conveniently operate during this period. The grippers hold the assembly until the sealing clamps firmly grasp the tube, whereupon they open and the cycle recommences. If a loaded container is being produced having sufficient weight, the grippers are not required, since the weight of the several containers in the assembly is sufficient to hold the latter in vertical position. With light packages the grippers are preferred, since they not only hold the assembly taut, but tend to prevent twisting and secure a better action of the knives. Fig. 21 shows the grippers omitted. Figs. 1 and 3 show the machine without the grippers, but by adjusting the slide box 114 downwardly the grippers may be added thereto.

While I have shown and described the preferred construction, it will be understood that I do not wish to be limited thereto, since numerous and varied changes may be made therein without departing from the spirit of the invention.

What I claim is:

1. In a packaging machine, a tube former, a heated sealing clamp, means for opening and closing the clamp to heat-seal the tube, and means for reciprocating the clamp to draw out a further length of tube.

2. In a packaging machine, in combination, a tube former, an end sealing means comprising two members adapted to approach each other to grasp the tube and to reciprocate to draw out successive lengths of tube, means for imparting said motions to said members and means for heating said members.

3. In a packaging machine, the combination of a tube former, an end sealing means comprising two members adapted to approach each other to grasp the tube and to reciprocate to draw out a further length of tube, and means for imparting both said motions to said members, said means comprising cam levers to separate the members and a crosshead to reciprocate the members and driving mechanism for operating said levers and crosshead.

4. In a packaging machine, the combination of a tube former, reciprocating clamp means for drawing the container material past said former, heat sealing means for the tube adapted to be operated by said clamp means, gripping means for holding the packages below the travel of said clamp means, and severing means arranged below the gripping means to sever the individual packages.

5. In a packaging machine, in combination, a tube former, a sealing element comprising a rotatable electric heater to seal a longitudinal joint of a formed tube, conductive connections through which the heater may be connected with a source of electromotive force, means for heat-sealing the formed tube at one end of a portion intended to receive a charge, and means for inserting a charge in said portion, the sealing means constituting means for also heat-sealing the tube at the opposite end of the charged portion.

6. In a packaging machine, in combination, a tube former, a pair of sealing elements having opposed corrugated surface portions between which portions of the wall of a formed tube may be pressed to seal a longitudinal joint, one of said elements being an electric heater, means for sealing the formed tube at an end of a portion intended to receive a charge, and means for insert-

ing a charge in said portion, the sealing means constituting means for also closing the tube at the opposite end of the charged portion.

7. A packaging machine comprising, in combination, means for progressively bending successive portions of a flat strip of suitable packaging material of relatively great length as compared with its width into a tubular form, means for closing, heating, and thereby sealing spaced portions of the resulting tubular structure to produce a succession of intervening individual merchandise containers, means for imparting to the sealing means movements such that it may serve as means to draw packaging material through the tube forming means and means for charging the respective containers with merchandise in succession as formed during the periods intervening between the sealing of their opposite ends.

8. In a packaging machine, a tube former, reciprocating closing mechanism adapted to act on the tube successively to close portions of it separated by portions adapted to serve as containers, means for charging each container between the times of closing of its opposite ends, and means to apply heat to the closed portions of the tube to seal them, the reciprocating closing mechanism constituting the means to move the tube material through the former.

9. In a packaging machine, a tube former, closing mechanism adapted to act on a formed tube to close it, means for heating the closing mechanism to render it effective as a heat sealer, and means whereby the closing mechanism may serve as a means to move the tube material through the former, said moving means comprising means for causing said closing mechanism to successively grasp the tube, pull it away from the former, release the tube after a given movement and then move the closing means toward the former for a succeeding operation.

10. A packaging machine comprising, in combination, means for progressively bending successive portions of a flat strip of suitable packaging material of relatively great length as compared with its width into a tubular form, means for closing, heating and thereby sealing spaced portions of the resulting tubular structure to produce a succession of intervening individual merchandise containers, means for reciprocating the sealing means whereby it may serve as means to pull the packaging material through the tube forming means, and means for charging the respective containers with merchandise as formed during the periods intervening between the sealing of their opposite ends.

11. A packaging machine, as defined by claim 10, having additional means for heat sealing the longitudinal seam of the tubular structure as formed.

12. In a packaging machine, a tube former, a bottom and top closer adapted to successively close spaced parts of a formed tube and thereby make separated compartments therein, said closer having a reciprocating motion so as to serve as a means for successively pulling down sections of tube from the former, means for charging the compartments as formed, means for applying heat to the parts of the tube closed by the closer, and severing means for detaching the individual containers after having been closed by said closer.

13. In a packaging machine, a tube former, a closer comprising a reciprocating clamping device adapted to close the bottoms and tops of a plurality of separate containers to be constructed from a formed tube and by its reciprocation to draw out further lengths of tube, means for charging each container after its bottom has been closed and before its top has been closed, and means for driving said tube closer comprising a reciprocating crosshead for reciprocating the closer, and means for opening the closer, said means comprising an elongated gear operative in all of the positions of the closer, and toothed means for driving said gear.

14. In a packaging machine, in combination, a tube former, a clamp provided with sealing means adapted to close the upper and lower ends of containers to be successively constructed from a formed tube, means for reciprocating said clamp to draw out further lengths of tube, means for charging each container after its bottom has been closed and before its top has been closed, and a severing device located below the range of movement of said sealing device and operative to detach the charged and closed containers from the tube.

15. In a packaging machine, in combination, a tube former, a clamp provided with sealing means adapted to close the upper and lower ends of containers to be successively constructed from a formed tube, means for reciprocating said clamp to draw out further lengths of tube, means for charging each container after its bottom has been closed and before its top has been closed, a severing device located below the range of movement of said sealing device and operative to detach the charged and closed containers from the tube, and a common operative means for said closer and said severing device, said means comprising gears and a rack for driving said gears.

16. In a packaging machine, in combination, means to grip a tube, means for reciprocating the gripping means, spring means for urging said gripping means in one direction, cam levers for moving said gripping means in the opposite direction, and means for transmitting motion to said cam levers comprising a pair of gears one mounted on the body of the machine and one so mounted as to be shifted with the gripping means, said gears having their axes parallel with the direction of reciprocation and teeth of relative widths such as to remain constantly in mesh.

17. A packaging machine comprising, in combination, means for progressively bending successive portions of a flat strip of suitable packaging material of relatively great length as compared with its width into a tubular form, means for successively closing spaced portions of the resulting tubular structure to produce a succession of intervening individual merchandise containers, means for imparting to the tube closing means movements such that it may serve as means to draw packaging material through the tube former, means for charging the respective containers with merchandise in succession as formed during the periods intervening between the closings of their opposite ends and means for successively heating and thereby sealing the closed portions of the tubular structure in the order in which they are formed.

18. A packaging machine, as defined by claim 17, of which the tube forming and closing means are so positioned that the tubular portion of the strip of packaging material between the flat portion and the last portion closed will be so disposed that the open end of such tubular portion will be of a materially higher level than

A-1
-15

Defendant's Exhibit A-1

the closed end, whereby merchandise may be fed into the partly completed containers as formed, from the charging means, by gravity.

19. A packaging machine, as defined by claim 17, having means for sealing the longitudinal seam of the tubular structure, as formed, by the application of heat.

20. A packaging machine, as defined by claim 7, of which the sealing means comprises a pair of dies having in their opposed faces complemental recesses and depressions of forms adapted to impress in the sealed portions of the tubular structure characters adapted to serve as a means of identification, advertising, etc.

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A-1
16

Defendant's Exhibit A-2.

April 14, 1936. W. R. ZWOYER 2,037,555

DYSPENSING MECHANISM

Original Filed Nov. 28, 1933 2 Sheets-Sheet 1

Fig. 1.

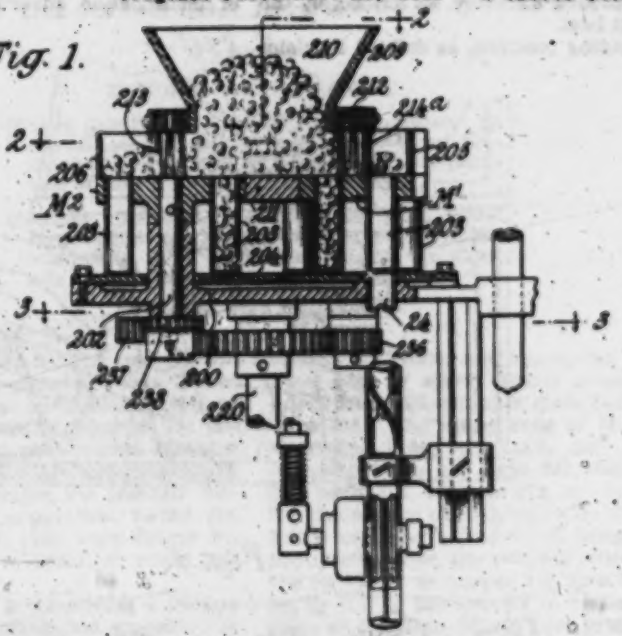


Fig. 2.

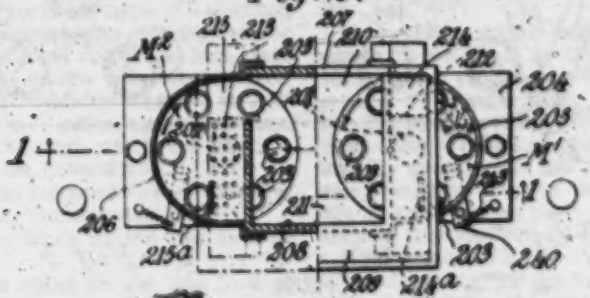
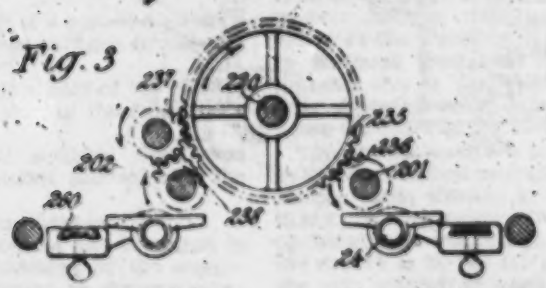


Fig. 3



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DISPENSING MECHANISM

Original Filed Nov. 28, 1933 2 Sheets-Sheet 2

Fig. 4.

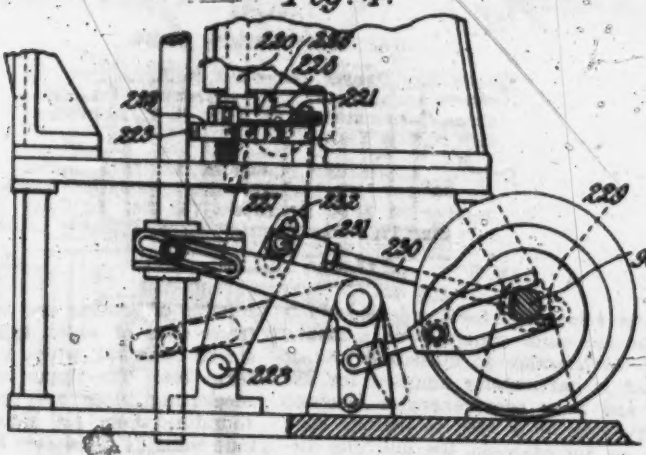


Fig. 6.

Fig. 7.

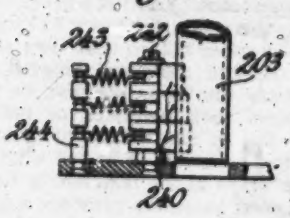
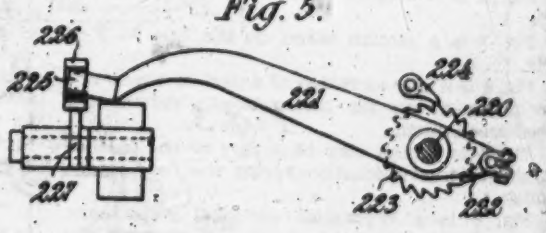


Fig. 5.



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Patented Apr. 14, 1936 2,037,555

UNITED STATES PATENT OFFICE

2,037,555

DISPENSING MECHANISM

Walter Ray Sawyer, Maywood, N. J., assignor, by mesne assignments, to Transparent-Wrap Machine Corporation, New York, N. Y., a corporation of New York

Original application November 28, 1932, Serial No. 700,697. Divided and this application November 30, 1934, Serial No. 755,434. In Canada May 17, 1934

5 Claims. (Cl. 221—266)

This invention relates to a feeding device which is adapted for use quite generally as a means of dispensing merchandise in measured lots or quantities, and is particularly adapted for use as a part of any more comprehensive machine in which there may be a need to include such a mechanism, as, for example, the machine disclosed in United States application, Serial No. 700,697, filed November 28, 1932, (now Patent No. 1,998,422, dated January 1, 1935), of which this application is a division.

The invention consists in improving a feeding mechanism of the above-described character by so modifying, correlating and adding to its parts that it will, with a greater degree of certainty, measure out and deliver single units or a specified number of units of merchandise, supplied to the device in units of uniform shape and size, such as candies, medicinal tablets, pills, etc., or uniform quantities of merchandise supplied in bulk form such as sugar, salt, coffee, tea, cereals, etc.

Referring to the drawings which are illustrative of one form of the invention,—

Figure 1 is a vertical sectional view of a feeding mechanism embodying the invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 1.

Fig. 4 is a side elevation of a part of a machine including means for intermittently driving the feed mechanism.

Fig. 5 is a plan view of a part of the mechanism for intermittently driving the feed mechanism.

Fig. 6 is a horizontal sectional view taken through the feed mechanism and showing the vibrators.

Fig. 7 is a detail of the vibrators.

A feeding device embodying the invention in the form of the one illustrated by the accompanying drawings is adapted to dispense merchandise to two units of a duplex machine. It may be mounted on a platform 200 secured to any appropriate means of support, and may comprise, in its preferred form, two measuring and feeding disks M', M², which are shown in plan in Fig. 2. A section taken on the line 1—1 in Fig. 2 is shown in Fig. 1. Each of the feeding disks M', M² is mounted to rotate in a horizontal plane, being fixed to the upper end of a shaft 201 or 202. These shafts are carried in bearings on the platform 200, the shafts being intermittently driven by means hereinafter described. Each feed disk carries an appropriate number of feeding and measuring tubes 203, the lower ends of which extend closely adjacent to a feed table 204, which is stationary on the platform 200. The upper ends of the feeding and measuring tubes are open, and partially surrounding them are rims 205, 206, which, with side walls 207, 208 (see Fig. 2), constitute a box for the supply of articles to be fed. Over this box is arranged a funnel 209 designed to receive the articles from any suitable source. Normally, the container or hopper 210 thus formed will be partly full of the articles to be fed. The upper sides of the disks M', M² are bridged by a stationary plate 211 (Fig. 2) so as to prevent the articles to be fed from falling downwardly around the disks.

Generally speaking, each of the tubes is designed to be filled by the articles lying above them in the container 210 during its movement around its circular path, and when it reaches the discharge position over the tube 24 (see the right-hand portion of Fig. 1) it discharges its load by gravity into the tube, which may serve as a means for feeding the dispensed merchandise to some desired place where it may be packaged or otherwise disposed of.

With many small articles, such as certain types of candy, there is a tendency to clog the upper ends of the tubes 203, so that they either do not contain the full measured amount when they arrive at the discharge position, or fail entirely to discharge their contents, or both. This is probably due to the weight or pressure of the body of the materials to be fed which is present above the tubes in the feed box or hopper.

The present invention provides a novel feature in this type of feed mechanism, in that it acts to fill the tubes without pressure at the time of filling. In other words, after a tube is emptied by discharging its contents at the appropriate point, the articles to be fed are permitted to pour into the tube without pressure. Preferably, each of the tubes is filled before it passes under the main body of the contents of the feed box. This is accomplished preferably by the construction shown wherein for each feed disk there is arranged a barrier in the form of a brush 212 or 213. This brush does not extend entirely across the feed disk, but is so proportioned that a space 214 or 215 is left between the end of the brush and the encircling rim 205 or 206. The bristles of the brush in each case extend close to the top of the disk, so as to hold back any material from the middle of the feed box on the delivery side, thus preventing any greater quantity being fed

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3

than is contained in the particular tube 263 which is in feeding position. This is rendered more positive by plates 216a, 216c.

By reference to Figs. 1 and 2 it will be seen that the right-hand disk is in the position where one of its tubes 263 is in alignment with the tube 24 and this tube 263 has discharged its contents. The next succeeding tube 263 is fully loaded, so that at the next forward movement of the feed disk M' such succeeding tube is brought to the discharge position. In the meantime the feed tube which has previously been emptied has gone forward one step and begins to receive some of the loose candy which has worked through the space 214 from the main portion of the hopper to an adjoining auxiliary portion. This candy is under no pressure or weight to speak of, and drops easily down to the bottom of the tube. On the next movement of the feed disk the tube 263 is practically or completely filled so that when this tube moves around under the body of the material in the main portion of the feed box or hopper it is already in a filled condition and can not be clogged or choked in any way. At the same time the construction is such that no dangerous surplus of candy or other article can pass through the space 214, the flow from the main portion of the feed box or hopper being laterally outward along the top of the disk and being self-regulating if the space 214 is properly proportioned.

The two feed disks may be given proper intermittent motion designed to carry each tube 263 step by step over the feed pipe 24. The means for accomplishing this, as shown in the drawings, comprises a main vertical shaft 220 which may be driven by a pawl lever 221, as is clearly shown in Fig. 8. This pawl lever is pivoted on the shaft, and carries at its extreme end a pawl 222, which acts upon a ratchet 223 fixed to the shaft to impart intermittent movements to the latter as the lever 221 oscillates. A pawl 224 is arranged on a fixed part of the machine, which pawl acts on the same ratchet wheel 223 and prevents reverse movement of the shaft during the idle movements of the pawl 222. The end 225 of the lever 221 enters a reciprocating yoke 226 mounted upon a rocking lever 227. This rocking lever 227 is clearly shown on Fig. 4, being pivoted in a stationary fulcrum 228 and being driven by a crank 229 mounted on the shaft 88 through the medium of a pinion 230 which connects the crank with an adjustable pivot 231 held in a slot 232 formed in the lever 227. Thus, on every rotation of the shaft 88 the feeder shaft 220 is given a forward angular movement, the movements of the shaft being intermittent. As will be best seen in Fig. 3, these intermittent movements of the feeder shaft 220 are transmitted to the shafts 201 and 202 by a gear train which comprises a large gear 233 keyed to the feeder shaft 220 and meshing directly with a pinion 234 keyed to the lower end of the shaft 201 which operates the right-hand feed disk M' and indirectly, through the medium of an idle gear 237, Fig. 2, with a pinion 238 connected to the shaft 202. This indirect connection is provided to reverse the rotation of the feed disk M', since it has been found in practice that with a feed supply which is common to two individual disks (such as is provided by the feed box and hopper), trouble is occasioned if the two feed disks rotate in the same direction, which trouble is avoided by reversing the direction of the disks.

It sometimes happens, in the feeding of particular articles such as chocolate-covered nuts or the like, that there is some adherence of the articles to the feed tubes 263, or a slight choking or jamming within these tubes. It has been found that this can be obviated by striking one or more blows on the tube 263 when approximately in the filled position. In Figs. 2, 6 and 7 a simple device is shown for accomplishing this result. In these figures one or more strikers 240 are illustrated, which may be formed of wood or other suitable material. These strikers may be pivoted on a common stud 242 and are provided with springs 243, which may lead to a common pin 244. Being of a length such as to be engaged by the various feeding tubes 263, and being urged by the springs in a direction opposite to the direction in which they are swung when engaged and moved by the feed tubes, it will be seen that, as the feed disks M', M'' rotate, each striker will be moved outwardly by one of the feeding tubes until it escapes the tube, whereupon it will strike the next succeeding tube with a blow which is determined by the tension on the springs 243. By the simple expedient of making the strikers of varying lengths, the timing of the blows may be accurately adjusted. It has been found that the best results are attained if the final blow is delivered just as the tube 263 arrives at its discharge position. One or more additional blows may be given slightly before this position is reached.

What is claimed is:—

1. A merchandise dispensing mechanism comprising a hopper including a main portion to serve as a source of supply of merchandise to be dispensed and an auxiliary portion in communication therewith, a barrier so disposed in the hopper as to impede without preventing the gravitation of merchandise from the main portion, thus permitting small quantities thereof to be distributed over the adjacent area only of the bottom of its auxiliary portion as merchandise is withdrawn from the latter, a discharge passage, a relatively movable feed-controlling element having an opening therein to receive a measured charge of merchandise, the opening being shiftable, by movement of the controlling element, from a position over and in communication with the discharge passage, but not in communication with the merchandise-covered portion of the hopper bottom, to a position under and in communication with the merchandise-covered area of the bottom of the auxiliary portion of the hopper, thence to a position under and in communication with the main portion of the hopper and thence again to its position over and in communication with the discharge passage, the mechanism being such that the cycle of movements of the feed-controlling element may be repeated indefinitely, and means to prevent the discharge of merchandise from the opening during its movement from its position in communication with the hopper to its position in communication with the discharge passage, the barrier being adapted to serve as a brush and so positioned as to sweep off surplus merchandise above the upper level of the opening in the feed-controlling element as it passes from its position under the main portion of the hopper to its position over the discharge passage.

2. A merchandise dispensing mechanism, as defined by claim 1, of which the feed-controlling element is a disk so positioned with respect to the parts of the hopper and the discharge passage that the opening in the disk may be successively moved by the rotation of the disk from its position over the discharge passage to its

Defendant's Exhibit A-2

merchandise receiving position under the auxiliary portion of the hopper, thence to its position under the main portion and thence to its position over the discharge passage.

3. A merchandise dispensing mechanism, as defined by claim 1, of which the feed-controlling element is a disk provided with a plurality of the merchandise receiving openings, the disk and its openings being so positioned with respect to the parts of the hopper and the discharge passage that the rotation of the disk may cause each of the openings to be successively moved from a position over and in communication with the discharge passage to a merchandise receiving position under and in communication with the auxiliary portion of the hopper, thence to a position under and in communication with the main portion and thence to its position over the discharge passage.

4. A merchandise dispensing mechanism, as defined by claim 1, of which the feed-controlling element is a disk having a plurality of the merchandise receiving openings spaced circumferentially therein, the disk and its openings being so positioned with respect to the parts of the hopper and the discharge passage that the rotation of the disk may cause each of the openings to be moved in succession from a position over and in communication with the discharge passage to a merchandise receiving position under and in communication with the auxiliary portion of the hopper, thence to a position under and in communication with the main portion and thence to its position over the discharge passage.

5. A merchandise dispensing mechanism, as defined by claim 1, having means for tapping and thereby jarring the feed-controlling element when the charge receiving opening is in communication with the discharge passage to insure the discharge of merchandise from the opening into the passage.

WALTER RAY ZWOYER.

A-2
5

Defendant's Exhibit A-3.

July 14, 1936. W. R. ZWOYER 2,047,243

SEVERING MECHANISM

Original Filed Nov. 28, 1933 2 Sheets-Sheet 1

Fig. 1.

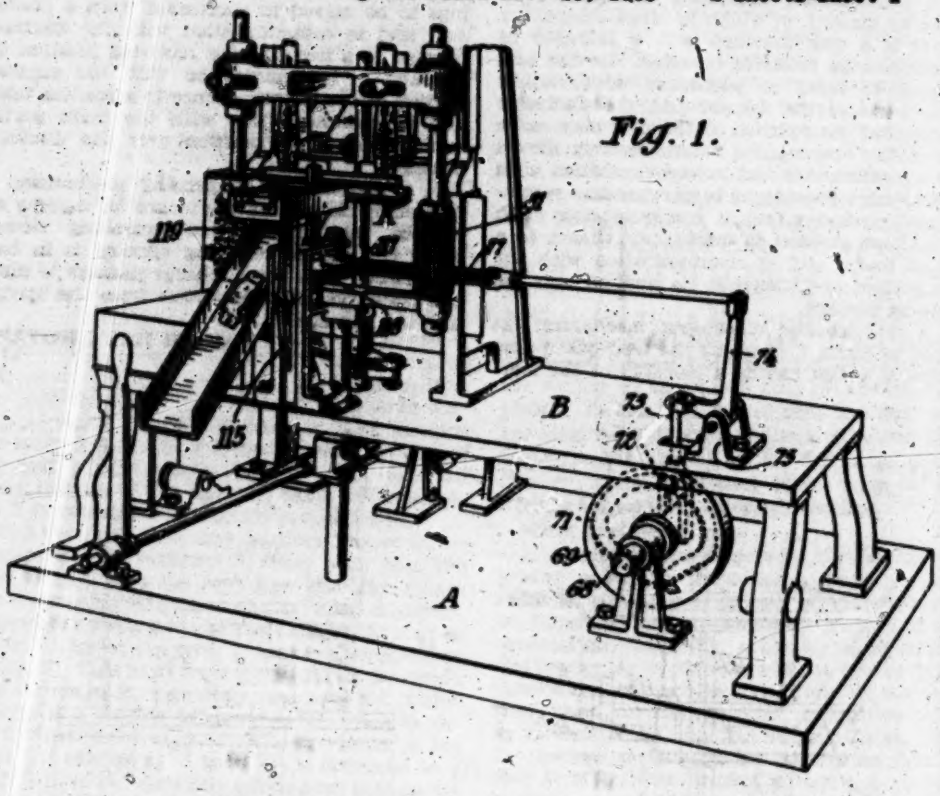


Fig. 2.

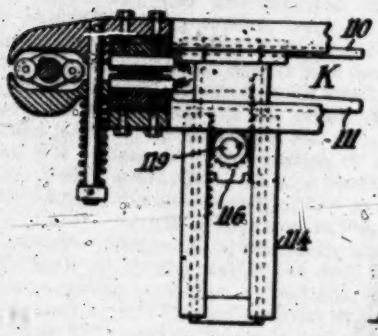


Fig. 3.

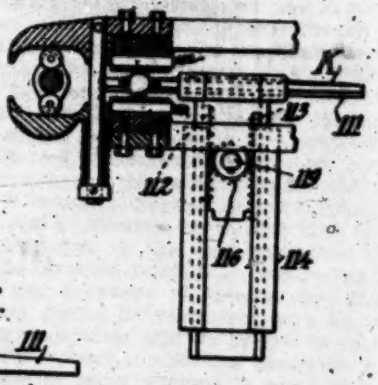
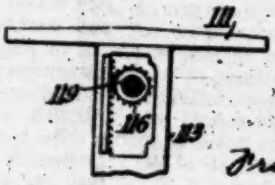


Fig. 6.



INVENTOR
Walter R. Zwoyer,
BY
Fraser, Myers & Manley,
ATTORNEYS.

A-3

Defendant's Exhibit A-3

July 14, 1936. W. R. ZWOYER 2,047,243

SEVERING MECHANISM

Original Filed Nov. 28, 1933 2 Sheets-Sheet 2

Fig. 4.

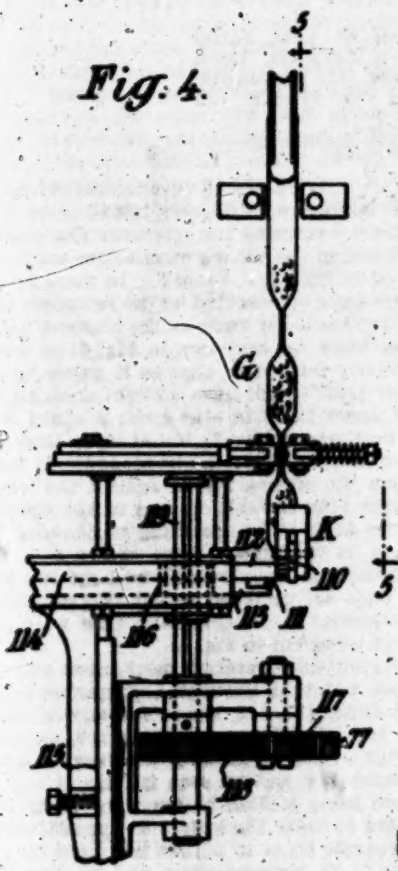


Fig. 5.

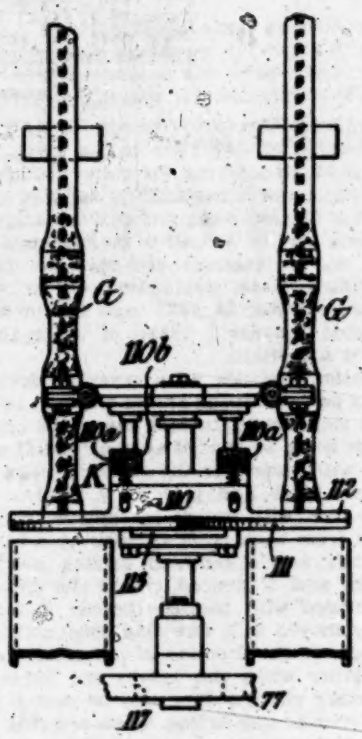


Fig. 7.

INVENTOR
Walter R. Zwoyer,
BY
Fraser, Myers & Manley,
ATTORNEYS.

A-3
9

Patented July 14, 1936

Defendant's Exhibit A-3

2,047,243

UNITED STATES PATENT OFFICE

2,047,243

SEVERING MECHANISM

Walter Ray Zwoyer, Maywood, N. J., assignor, by mesne assignments, to Transparent-Wrap Machine Corporation, New York, N. Y., a corporation of New York

Original application November 28, 1933, Serial No. 700,097, now Patent No. 1,986,422, dated January 1, 1935. Divided and this application November 30, 1934, Serial No. 755,423. In Canada May 17, 1934

4 Claims. (Cl. 164—47)

This invention relates to mechanism for cutting material produced in strip form into a plurality of separate parts by severing the material crosswise of the strip, and is particularly adapted for use as a part of any more comprehensive machine in which there may be a need to include such a mechanism, as, for example, the machine disclosed in United States application, Serial No. 700,097, filed November 28, 1933 (now Patent No. 1,986,422, dated January 1, 1935), of which this application is a division.

The invention consists of a severing device comprising a pair of cutting knives disposed substantially at right angles to each other, the edge of each blade being so located as to extend at an acute angle with respect to the adjacent surface of the opposed blade, and, preferably, the knives may be provided with means for moving them towards and from each other comprising a rack for each knife and a common driving pinion for the racks, and, if desired, one of the knives may be provided with means whereby it may be yieldingly moved in a direction substantially at right angles to its direction of movement towards the other when the knives are forcibly pressed together whereby they may be caused to cut with a scissors-like action when severing a strip of material.

Referring to the drawings which are illustrative of one form of the invention,—

Figure 1 is a perspective view of a part of a machine including severing mechanism embodying the invention and its operating means.

Fig. 2 is a top view, partly in horizontal section, of parts of a machine including severing mechanism embodying the invention.

Fig. 3 is a view similar to Fig. 2, but showing the parts in different positions.

Fig. 4 is an elevation of a part of a machine showing a cutting mechanism embodying the invention in detail.

Fig. 5 is a view taken at right angles to Fig. 4, certain parts being shown in section.

Fig. 6 is a detail view of the lower cutting knife.

Fig. 7 is a side view of a strip of material represented as having been cut through by the blades of a severing mechanism embodying the invention.

A severing device embodying the invention in the form of the one illustrated by the accompanying drawings is adapted to cut material by severing portions from two strips produced and fed to the device concomitantly, in a side-by-side relation, by a duplex machine of which the severing mechanism only will be disclosed and claimed herein. This severing mechanism is designated generally where it appears in the various figures of the drawings by the reference character K.

Details of the cutting mechanism are best illustrated in Figs. 2, 3, 4 and 5. In these figures the upper knife is indicated by the reference numeral 110 and the lower knife by the numeral 111. The lower knife (as best seen in Fig. 6) is somewhat angularly formed so that as it passes under the upper knife it will have a slight shearing action. The upper knife is also given a slight V-shape (as best seen in Fig. 5) but at right angles to the lower knife, so that the upper knife in fact rises during the cutting stroke against the tension of springs 110a suitably housed in the upper knife carrier 110b. The operating mechanism for the knives in the duplex form shown is connected with them at their middles and the two projecting ends are designed to cut two parallel strips of material G, G (Fig. 5). One such strip is shown being cut in Fig. 7.

Any suitable operating mechanism may be employed but that illustrated comprises a pair of rack slides 112, 113, which are carried in a slide box 114 fastened to a bracket 115, as best seen in Figs. 1 and 4. Each of the racks is moved by a pinion 116, as best seen in Figs. 2 and 3, this pinion being located between the racks and operating to move the knives in opposite directions to separate them to permit the down feed of the strips G, G, between them and to close them to sever the strips.

The driving mechanism for the knives is best seen in Figs. 1 and 4. Referring to these figures it will be seen that there is mounted on the base A of the machine a mechanism which may be driven from any desired source of power, not shown, said mechanism comprising a cam shaft 68 carrying a rotary cam 69 provided with a cam track 71, shown in dotted lines in Fig. 1, in which cam track is mounted a cam roller 72 connected by a pitman 73 to the short arm of a bell-crank lever 74 mounted in a bearing 75 on the table B. The cam movement is such as to reciprocate the pitman 73 in a vertical direction, which movement, being translated by the bell-crank lever, insures a horizontal reciprocation of an elongated rack 77. This rack 77, which is best seen in Figs. 1 and 4, transmits motion to the pinion 117, which in turn meshes with a similar pinion 118, to which is fixed a shaft 119 carrying the pinion 116 midway of its length, as shown in dotted lines in Fig. 4 and in plan in Figs. 2 and 3. The proportions of the gears are so designed that the reciprocations of the rack 77 afford the neces-

A-3

Defendant's Exhibit A-3

sary opening and closing movements of the knives, and these are best timed to close and sever the strips G while they are held stationary by strip feeding means not herein specifically disclosed and claimed.

What is claimed is:—

1. A mechanism for severing material from a strip comprising a pair of shearing blades having their respective edge opposing surfaces disposed in planes which intercept each other at a blunt angle, the edge of each blade being inclined at an acute angle with respect to the opposed surface of the other, and each blade being movable in a direction having a crosswise component with respect to the plane of the edge opposing surface of the other, the edge opposing surfaces of the blades, the inclinations of their edges, and their directions of relative movement being such that movement of one blade towards the other will bring their edges in a point-to-point contact and further movement of the same blade in the same direction will tend to cause the other to move in a direction such that the point of contact between the blades will travel along the line of intersection between the planes of their edge opposing surfaces whereby the device may cut with a scissors-like action.

2. A severing mechanism, as defined by claim 1, of which the edge opposing surfaces are disposed in planes which intercept at right angles.

3. A severing mechanism, as defined by claim 1, of which the respective blades move in directions parallel with the planes of their edge opposing surfaces.

4. A severing mechanism, as defined by claim 1, comprising means for forcibly moving one of the blades towards the other and means for yieldingly opposing the movement of the other blade.

WALTER RAY ZWOYER.

A-3
7

Defendant's Exhibit B. 805

Oct. 7, 1935

Transparent-Wrap Machine Corp.,
313 Hudson St.,
N.Y.C.

Att: Mr. A. Zwoyer

Gentlemen:

The writer expects to be in New York, at the Hotel Governor Clinton, on Wednesday and Thursday of this week, and would like to arrange sometime to see Mr. Zwoyer to talk further regarding the matter of the possible use of all or a portion of one of our Filling Machines in connection with your Wrapping Machine. 806

If, for any reason, it will be impossible for you to see him on one of the days mentioned, kindly wire us tomorrow. And in any case, kindly address the writer at the Hotel Governor Clinton, stating what time would be most convenient to you. Preferably it should be Wednesday afternoon. 807

Very truly yours,

STOKES & SMITH CO.
Sgd: D. E. MAXFIELD

D.E.Maxfield:IB

808 **Defendant's Exhibit C.**

October 29, 1935

Transparent-Wrap Machine Corp.
313-321 Hudson St.,
New York City.

Attention: Mr. Walter R. Zwoyer

Gentlemen:

809 We are discussing with one of our customers the purchase of several units of our Envelope Filling and Sealing Machines. It is for filling and sealing a small envelope containing about a half teaspoonful of a salt. It is quite possible that they might consider one of your units rather than ours.

Our enthusiasm in discussing one of your units with them would be much greater if there could be some arrangement whereby we could obtain a commission for the sale of one of your units. The writer would like to discuss this question with you within the next week or ten days. Please let us know when would be a convenient time to review it.

810

Very truly yours,

STOKES & SMITH CO.
Sgd: D. E. MAXFIELD

D.E.Maxfield:IB

811

Defendant's Exhibit D.

November 15, 1935

Transparent-Wrap Machine Corp.,
313 Hudson St.,
New York City.

Attention: Mr. W. R. Zwoyer

Gentlemen:

Thanks for your order #8006, from Henry Heide, Inc.

As we recall it, the precise length of the auger and sleeve was not determined in our conference here. We, of course, would have to know this definitely before making the auger and sleeve. 812

Our Chief Engineer, Mr. Charles H. Nitsch, expects to be in New York on Monday afternoon, and would very much like to see your machine. At the same time he could discuss with you the proper length for this auger. If it is satisfactory to you for Mr. Nitsch to see the machine Monday afternoon, will you kindly telegraph us on receipt of this letter.

Very truly yours,

STOKES & SMITH CO. 813
Sgd: D. E. MAXFIELD

D.E.Maxfield:IB

P.S. We have quoted Millers Peanut Products, Inc. in Detroit on one of our Filling Machines for peanuts, filling at the rate of about 20 per minute, and they say they want a more fully automatic machine and having a production of 60 per minute or over. We would like to offer them one of your machines if it is agreeable to you, and if so, would like to have you send us a proposition which we could forward to them; and if you care to do so, you might allow us some commission in the event of a sale. The quantities of salted peanuts which they propose to package are 1¾ and 2½ ounces.

814

Defendant's Exhibit E.

November 26, 1935.

Stokes & Smith Co.,
Summerdale Ave. nr. Roosevelt Blvd.,
Philadelphia, Pa.

Attention: Mr. D. E. Maxfield

Gentlemen:

Referring to the postscript to your letter of the 15th instant, we submit the proposal to pay you, until further notice, a sales commission of five (5%) per cent on bona
815 fide sales by yourselves on TRANSWRAP machines. The commission is to be paid on the net invoce value and is to be considered as earned only after invoice payments have been received by us from the purchasers. Installation of TRANSWRAP machines is to be done by us.

A like proposal has been made to the Package Machinery Company of Springfield, Mass., which firm was the first to approach us on the subject of sales commission. To avoid possible misunderstanding and confliction the commission will be paid to that sales agent who first consummates the sale to our satisfaction.

816 Inasmuch as we are limiting the sale of TRANSWRAP machines in such manner as and to the extent that we deem advisable, it is hereby understood and agreed that no offer to sell nor any other commitment whatsoever shall be made by you before communicating with us in writing and obtaining our consent in writing.

In the event that this proposal meets with your acceptance, please let us know by letter and we will be guided accordingly.

Yours very truly,

TRANSPARENT-WRAP MACHINE CORPORATION
W. R. ZWOYER, Director

WRZ:JG

817

Defendant's Exhibit F-1.

STOKES & SMITH CO.
Philadelphia, U. S. A.

March 20, 1936.

Mr. Herman L. Heide,
Henry Heide, Inc.
313 Hudson Street,
New York City.

818

Dear Mr. Heide:—

I regret so much that I had to run away from you last Wednesday—it so happened I had two Board meetings to attend. I would gladly have avoided these but particularly important matters were coming before each of them.

We enjoyed your visit with Mr. Zwoyer very much and certainly are great believers in your machine and its wide possibilities for the future. As a suitor for your hand it is rather a sporting proposition to see whether we can win your confidence against our rivals.

819

Of course your machine, in a general way, is in the same class with the machines we have been building since we started business, and our shop, in consequence, is adequately equipped for this work. We have developed so many new and original machines that we have a highly trained experimental staff who would be available for developing your ideas in the fullest extent. I am sorry I neglected to show you our research room on the second floor, where behind closed doors a lot of our developments are taking place.

820 *Defendant's Exhibit F-1*

Our wide experience in the building of filling machines which would be incorporated in your machine, and our familiarity with this field I think are also points in our favor. Note the great variety of products we are handling, many of which are itemized on the enclosed list.

I think it was Emerson who said something to the effect —"Don't tell me what you are, for what you are is thundering about my ears and I cannot hear what you say". So I will not continue singing our own praises.

I am sending herewith some of our recent publications
821 to give you an idea of our methods of backing up our selling organization, which we feel very effectively cover every section of this country and are well backed up by our service men.

I shall be very happy to come to New York and discuss the matter further with you if you look at all favorably upon our suit.

Very truly yours,

(Sgd) J. S. Stokes
President
822 STOKES & SMITH CO.

J. S. Stokes: D
enclosures.

Defendant's Exhibit F-1 823

THE PRIME REASON FOR A PACKAGE
TO TIE YOUR NAME TO THE
EXCELLENCE OF
YOUR PRODUCT

Stokes & Smith machinery is used in connection with the following materials, either for covering the paper boxes in which the material is placed; the filling, sealing or wrapping of the cartons containing the material; or the filling of the tin cans or other containers for the various products. 824

Allspice
Alum Powder
Aluminum Powder
Arrow Root
Arsenate of Lead

Baby Food
Bacon
Baking Powder
Bandages
Banks
Bath Salts
Bathing Suits
Batteries
Beans
Belts
Bird Food
Bird Gravel
Bismuth Comp.
Bluing
Books
Borax
Boric Acid
Bronze Powder
Buttons

Cakes
Candles
Candy
Carbon Black
Cards
Cartridges
Caviar
Cards—Playing
Cereal
Cheese
Chicory
Chocolate Bars
Chocolate Powder
Cigars
Cigarettes
Cinnamon
Citric Acid
Cleanser
Cleansing Powder
Clocks
Cloves—Ground
Cocoa
Coffee—Ground
Coffee—Pulverized
Coffee—Whole

Collars
Colors
Condensers
Core Filler
Corn Meal
Corn Starch
Corsets
Cracker Meal
Cream—Powdered
Cream—Vanishing
Cream of Tartar
Currie Powder 825

Dental Plaster
Dental Supplies
Deodorant
Depilatory Powder
Dessert Powder
Dog Food
Dolls
Drinks—Powdered
Drugs
Dyes

Epsom Salts
Erasers

826 *Defendant's Exhibit F-1*

Face Powder
False Teeth
Fertilizer
Files
Fire Extinguishing material
Flaxseed Meal
Flea Powder
Flour
Flour—Pancake
Flour—Rice
Flour—Self-rising
827 Flour—Waffle
Foot Powder
Fullers Earth

Games
Garters
Gauges
Gelatin-Powdered
Gifts
Ginger
Glasses
Gloves
Goggles
828 Golf Balls
Graphite
Gravel
Greeting Cards
Gum
Gun Grease
Gun Powder

Handkerchiefs
Hardware
Henna Powder
Hinges
Hops
Horse Radish
Hosiery

Incense
Infants' wear
Ink—Powdered
Insecticides
Investment
Instruments

Jelly Powder

Kalsomine
Kisses

Labels
Lamp Black
Leather Goods
Licorice
Liver Salts

Macaroni
Macaroni—Short Cut
Magnesia
Malted Food
Malted Milk
Malt—Molak
Matzos
Milk—Powdered
Mince Meat
Moth Balls
Moth Flakes
Mustard—Ground
Mustard Seed

Nail Enamel
Nail Polish
Needles
Nipples
Noodles
Nutmeg—Ground
Nuts

Ointment
Onion Powder
Overshoes

Pajamas
Paprika
Paris Green
Peanuts
Peanut Butter
Pectin
Pencils
Pens
Pens—Fountain
Pepper
Perfume
Photographs
Pictures
Pie Filling
Pins
Pipes
Pipe Cleaner
Plaster
Plastic Wood
Pomade
Popcorn
Prunes
Pudding Powder
Pumice
Puppy Food
Putty
Pyrethrum

Raisins
Rat Embalmer
Razors
Razor Grinders
Rice
Roach Powder
Rochelle Salts

Defendant's Exhibit F-1 829

Rosin
Rubber Bands

Sachet Powder
Sage
Salt
Salt Petre
Salve
Sand
Sausage—Seasoning
Scouring Powder
Seeds
Shampoo Powder
Sheep Dip
Shirts
Shoes
Shoe Polish
Silk
Silver Polish
Silverware
Slug—Shot
Smoke Powder
Snuff
Soap
Soap Powder
Soda Bicarbonate
Soda—Caustic
Sodium Phosphate
Soft Drink Powder
Soup Powder
Spices
Sugar—Brown
Sugar—Granulated
Sugar—Powdered
Starch
Stationery
Sulphur
Shoe Brushes
Supporters
Sweaters
Syringes

Talcum Powder
Tape
Tapioca
Tea
Thermometers
Thread
Throat Lozenges
Ties
Tire Tubes
Toilet—San
Tooth Powder

Underwear

830

Vanishing Cream
Vanilla Pudding

Wafers
Washing Compound
Watches

Zinc—Stearate of
Zinc Ointment

831

832 **Defendant's Exhibit F-2.**

STOKES & SMITH Co.,
Philadelphia, U.S.A.

May 25, 1936.

Mr. William F. Heide, President,
Transparent-Wrap Machine Corporation,
313-321 Hudson Street,
New York City.

Dear Mr. Heide:

Of course we all regret very much your decision regard-
833 ing your machine, that you have communicated to us in your letter of May 20th. Personally I have been very much interested in it as I firmly believe in its possibilities for a wider field of usefulness than has yet been suggested.

Perhaps the time will come later when the matter can be reconsidered.

In our own business we find it most important to back up our machines by an active research department, for competition is bound to develop sooner or later and to keep ahead of the procession you cannot rest on any one achievement, however promising it may look.

834 I feel we would have been an important help to you on this side, as well as the strong support you would have had from a widely extended selling organization.

The machinery business is a difficult one at best and it will require the careful attention of some of you that it may hold its own in a field in which great advances are continually being made.

It is unusual to find so good a machine in the hands of persons with whom you would enjoy being associated, and this further adds to our regrets.

Sincerely yours,

(sgd) J. S. STOKES
President,
STOKES & SMITH Co.

J.S. Stokes:D

Defendant's Exhibit G.

STOKES & SMITH Co

TRANSWRAP PACKAGE

- PROTECTION
- VISIBILITY
- EYE-SALES APPEAL
- LOW UNIT COST

made of CELLOPHANE · PLIOFILM · HEAT SEALING PAPER or FOIL from the roll

for packaging coffee (steel cut, Silex ground or pulverized), candy, popcorn, nuts, crackers, powders, pills, tablets, granular materials and miscellaneous articles.

for MAXIMUM DISPLAY value

You can use the attractive display cartons designed by the carton manufacturers.

Ideal for SAMPLE PACKAGES

. . . for distribution individually or packed with another product.

TRANSWRAP is more than a machine, more than a package—It's a merchandising plan that can be used to give your product terrific sales impact!

Neat and attractive, the web may be of Cellophane, Pliofilm or approved heat sealing paper or foil. Plain, or printed—single, double or laminated—web as supplied by any convertor; and the package may be either of the pillow type, or with gusset folds, or "Finseal" type. Heat sealing, with carefully controlled temperature, insures a tight package, yet the serrated or notched cut-off makes it very easy and quick to open. And, using Cellophane or Pliofilm, your package has all the advantages of sparkling transparency with perfect visibility of the contents!

THE TRANSWRAP PACKAGING MACHINE

forms, fills and seals the package, taking the printed or unprinted we from the roll—at speeds of from 50 to 100 packages per minute, depen ing on size of package, kind of web and nature of material.

Registry of the printed transparent or opaque web is obtained by photo electric control. Where voltage regulation is needed to insure uniform voltage for the heat seal and registry control—and where a neutralizer is required to eliminate static electricity—attachments are provided.

In some cases, an attachment is placed on the machine to punch a hol in the end of each package; and, where desired, dies are furnished fo impressing the initials of the manufacturer on the end seal of each package.

Where CO_2 gas should be introduced into packages, a gassing attach ment can be furnished.

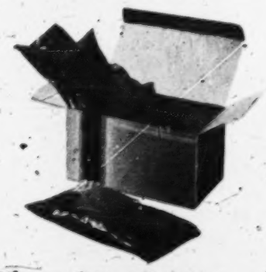
The important point to remember is that, while the TRANSWRAP machine is standard construction up to a certain point, from then on it is custom-built to suit your particular needs for type of webs and feeding of the material.

SEE FOR YOURSELF HOW APPEALING YOUR PRODUCT IS IN A

TRANSWRAP PACKAGE

Send us a small quantity of your product and we will gladly furnish samples of the product in the TRANSWRAP package — together with approximate costs and other detailed information.

LOW COST PACKAGE



Where it's advantageous to use a Multiple Package

The merchandising of your product in multiple packages provides longer lasting freshness, convenience of use and numerous other advantages.

Use it as a LINER

When you use TRANSWRAP packages in a carton, with or without window, you get the very tightest lined carton package with all the protection of the heat sealed web.

PACKAGING MILLIONS OF RATION "K" UNITS FOR THE ARMY

Contents are fully protected against any climate — freshness and flavor are sealed in.

S & S UNIVERSAL FILLER

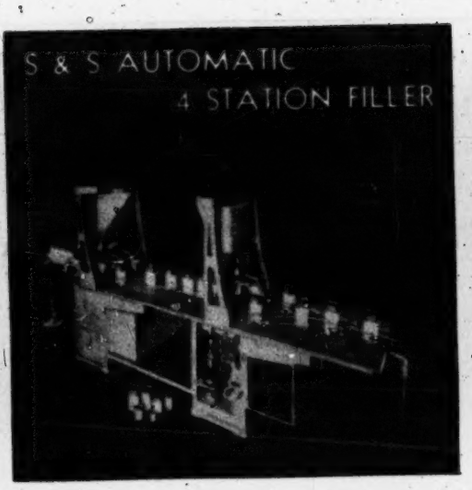
MATERIALS: Powders, granular products, pastes.

CAPACITY: ⅓ oz. to 5 lbs. — any container.

PRODUCTION: 15 to 30 per minute.

OPERATORS: One. Filling by gross weight, volumetric measurement or packing.

S & S AUTOMATIC 4 STATION FILLER



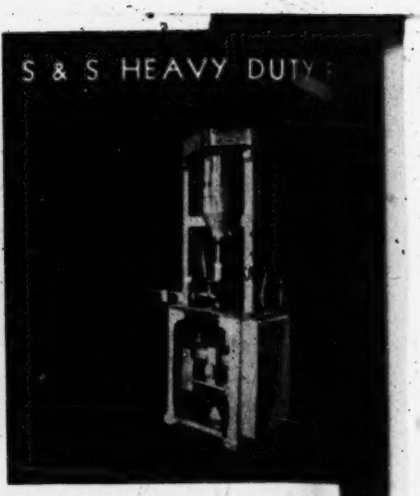
MATERIALS: Powders, granular products.

CAPACITY: 1 oz. to 5 lbs. — cans, boxes, canisters.

PRODUCTION: 60 to 120 per minute.

OPERATORS: One. Filling by gross weight, volumetric measurement or combination of both.

S & S HEAVY DUTY



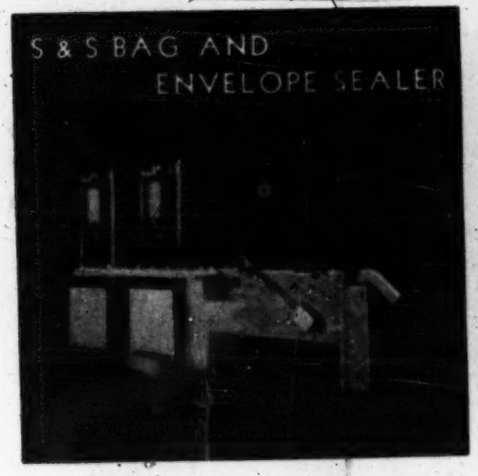
MATERIALS: Powders, granular p… pastes.

CAPACITY: ⅓ oz. to 15 lbs. — a… tainer.

PRODUCTION: 10 to 20 per minu…

OPERATORS: One. Filling by gross … volumetric measurement or packi…

S & S BAG AND ENVELOPE SEALER



MATERIALS: Powders, cereals, seeds, chemicals, etc.

CAPACITY: Envelopes 2" to 8" high, when closed.

PRODUCTION: 60 to 120 per minute.

OPERATORS: None. Entirely automatic. Connects with and seals filled envelopes from powder filler or net weight scale.

S & S AUTOMATIC TIGHT WRAPPER

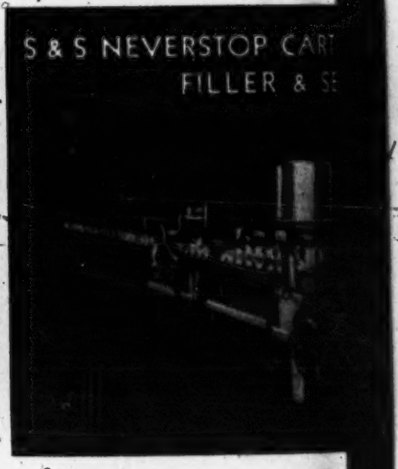
MATERIALS: All food and grocery products.

CAPACITY: Maximum carton: 10" x 6½" x 4" — Minimum carton: 3¾" x 1½" x 1".

PRODUCTION: 60 to 70 per minute.

OPERATORS: One. Automatically tight-wraps carton with printed label, after it is filled and sealed, making attractive, siftless, tight-wrapped package for all products.

S & S NEVERSTOP CART… FILLER & S…



MATERIALS: All food and grocery p… in cartons.

CAPACITY: Maximum carton: 1… 6½" x 4½" — Minimum carton: … x 1⅛" x ¾".

PRODUCTION: 40 to 75 per minu…

OPERATORS: One. Several models … cartons, bottom seals, fills, top s…

Write us about your packaging problems

STOKES & SMITH Co

PACKAGING MACHINERY — **PAPER BOX MACHINERY**

4943 SUMMERDALE AVE., PHILA. 24, U.S.A.

Form 4943

Print…

838 **Defendant's Exhibit K.**

September 17, 1942.

Transparent-Wrap Machine Corporation,
313 Hudson Street,
New York City, N. Y.

Attention: Mr. W. R. Zwoyer.

Dear Mr. Zwoyer:

839 Thanks for your letter of September 15th. Mr. Waters is now claiming a patent on an envelope of laminated material in which the heat sealing is made by attaching the inner surfaces to each other. This would read on much of the work done on the two piece package. I have talked it over with our patent attorney and he don't think he has much grounds to stand on. We have ordered a file wrapper from Washington and will see what is cited against it. All his claims begin—

> "A plural ply open-mouthed bag comprising an inner ply of heat-fusible material and an outer ply of other flexible material, etc."

840

The patent No. is 2,278,502 of April 7, 1942 and applied for on July 18, 1936—Serial No. 91,363.

Maxfield's Patent No. 2,154,521 of April 18, 1939 discloses this exact thing but his filing date was later than Waters.

I think your patent attorney would be interested in getting a copy of the Waters patent and commenting on its scope.

You promised to send me a copy of your attorney's report on the Ivers-Lee two piece package which you said was

Defendant's Exhibit K 841

entirely favorable. I would be glad to have it at your convenience.

With best wishes,

Sincerely yours,

President,
STOKES & SMITH Co.

J.S.Stokes:D
Copied 11/5/45-hnsc

842

Defendant's Exhibit L.

February 27, 1939.

Mr. Herman L. Heide,
Transparent-Wrap Machine Corporation,
313-321 Hudson Street,
New York City.

Dear Mr. Heide:

I was more pleased than I told you with your comments last Friday over our Transwrap association, to the effect that if you had to do it over again you would do exactly the 843
same thing again. In other words, you had no regrets. I can assure you the association has been a delightful one for us and it is a real satisfaction to know you have not been disappointed in the way we have handled the business.

Naturally, a year or more of handling the business has given us all, knowledge based on facts and experience that we did not have at the start. When the contract was considered, we suggested a certain formula for dividing the profits, the advantage of which was that it allowed for certain variables that could not be fully anticipated at the start. For good reasons you preferred some definite figures, to

844 *Defendant's Exhibit L*

which we agreed. However, the variables have all worked havoc to our profits, yet to our general good they could not be avoided. These may be considered under three heads.

In the first place, we soon learned that while the basic machines were essentially the same, each one required special engineering and experimentation on the feeding mechanism. This prevented the manufacture of parts in quantities and required the time and skill of many of the best men on our engineering force. This of course, is the most expensive type of work and breaks down all estimates of cost.
845 We might have said in many cases, "No, the Transwrap machine cannot do this type of work". That would have been an easy and simple way out of it, but we would have lost many orders by such a course and competing machines might begin to get into this field. So we have attacked these problems as they arose and this has certainly proven the wise course to follow even if the profits to us had to be largely given up. In short, the inability to manufacture important parts of the machine in quantity, combined with expensive engineering, has largely eliminated the profits on many machines we have sold and affected adversely the
846 profits on all of them.

The second point is that of servicing. You can imagine that with the new types of feeds that have developed and the great variety of products we have been asked to handle, the machines require a degree of servicing beyond any point anticipated by either of us. Before a machine is accepted we have to make it work, no matter how hard the problem has been, and that has meant repeated visits by our men. After the machine is accepted we can frequently charge for such work, but many times the fault is really ours as you cannot always anticipate the trouble, and customers refuse to pay our demonstrating cost, which involves travel and hotel bills.

Defendant's Exhibit L

847

The third point I would like to bring up is the question of general research. The machines have remarkable high production and well worth the price charged, but the number of manufacturers who can use them is to a certain extent limited on this account. So it is important for us to reach out into new fields, not only from the standpoint of increasing the business but also with the idea of dominating the field against competition which is almost sure to come from some direction. So we have adopted the policy of p'owing back much of our profits into developing new lines and dominating this field by the perfection and variety 848
of our developments, and the great strength we can add to the patent wall not only helps us to stop competitors but to a very considerably extent prolong the life of the patents.

The packages I left with you containing oil, represent a very promising field, and the new pliofilm machines we feel will add largely to the possibilities for the future. The first of the e machines to be sent out has proven entirely satisfactory and a duplicate order arrived this morning from our customer.

The importance of this research is so obvious that we have gone right on with it irrespective of cost, and we now 849
have very valuable inventions added to our list.

What I wish to emphasize is that the three points above considered are all essential to the health and growth of the business. None of them were fully considered in our contract and all of them add greatly to your benefit in strengthening and lengthening the life of the business, and in the long run will work greatly to our mutual advantage.

No business can remain static. If we had not stepped out as we have in all these lines of activity, the business I feel confident would have dwindled in a few years and neither of us would have gotten much from it.

850 *Defendant's Exhibit L*

We have great faith in the future possibilities of the Transwrap idea, but success will not be achieved without hard work, good manufacture, proper servicing of the machines and constant research to apply the general principles of the machine to wider fields, with the continual securing of new patent protection, all of which costs real money.

In regard to competition, the work of the Owens-Illinois Glass Company has given the most concern, as they are doing research in this field and have quite a number of patents already issued. I thought it very important to get in
851 touch with them and through a mutual friend I secured a letter of introduction to their President Mr. Lewis, and called on him at his office in Toledo last Fall. A pleasant association has resulted from this visit, and we have had calls at different times from three or four of their staff. Among these men were Mr. Urben E. Bowes, Director of Research and Mr. H. A. Barnby, Director of the Packaging Research Division. To show the pleasant relationship which exists, I enclose a copy of the last letter we received from Mr. Barnby.

I feel that any confliction of patents can be avoided, and
852 if necessary we would not have trouble in having them license us if in any way we infringe their rights. They have patented a method of filling and making liquid containers somewhat similar to the packages I left with you and they are starting to send out some 65,000 of these to Socony agents in Michigan and one other State to get experience. The paper carton which contained one of the samples I left with you is of their manufacture and is what they are using in shipping. They speak of using our machine in making this cardboard container. I have not talked to them directly as yet about the liquid packages, but from information they have given me, our method will

be very much better I am sure than theirs, as at present they can fill but about 12 per minute whereas I think we can do probably up to 50. They assure me they do not want to manufacture machinery, and seem inclined to look to us for this support.

I simply mention this to show that we cannot exclude others from entering our field and some unfriendly competition might develop at any time. All of this emphasizes the importance of research and continual striving to patent new developments that lead to improved and quicker methods of manufacture. 854

Please forgive this long letter, but I know you will welcome a frank presentation of the problems we have before us as manufacturers and distributors of the Transwrap machine. My suggestion is that the royalty be reduced to 10% in consideration of the contributions which we have to make to the enterprise, which you will recognize as highly important. 10%, as a matter of fact, is liberal. In the many contracts we have had during the years, only one I know of has been as high, and that is for a simple device which has never required experimentation, and servicing expense, and can be produced in quantities—all of which elements are lacking in the Transwrap machine, the contract of which has proven to be the most onerous we have ever had. 855

Of course, we could advance our prices but this we feel would be a mistake, inviting competition and reducing sales. On page 4 of our contract we have a provision that in the event of change in prices the original formula may be considered, resorting to arbitration if we could not agree.

I do not feel that we need consider this but it is interesting to calculate how these figures would work out. After we sold the first twelve machines we worked it out and found the royalty would average, on the basis of the for-

856 *Defendant's Exhibit L*

mula, $364.00 or 7.8%. Of course these figures do not include much of the cost of the research that is going on and the patent expense, but I mention this to confirm that the 10% royalty now proposed would be liberal and would be in excess of the formula originally considered.

We have enjoyed our association so much that we certainly do not want you to regard us as chiselers or as a company asking for something it is not entitled to. If you would take the trouble to investigate the royalties that are being collected in similar enterprises, I am sure you would
857 find 10% of the selling price much higher than usually paid.

The course we are pursuing will greatly prolong the patent protection and largely increase the volume of business, and customers will have the satisfaction of the intelligent service we provide. All of these points are important and as business men I think you will realize the fairness of our request. We certainly hope so, for we are enjoying the business and are intensely interested in it, but after all you are in business to get returns from your efforts and these have been so minimized that I feel justified in bothering you with this long letter, which I have
858 been brave enough to send as we have such complete reliance in your fairness and good will.

Very truly yours,

President,
STOKES & SMITH CO.

Sgd. J. S. Stokes

J.S.Stokes:D
enc.

859

Defendant's Exhibit M.

January 26, 1944.

Transparent-Wrap Machine Corporation
313-321 Hudson Street,
New York City, N. Y.

Attention: Mr. William S. Heide,
President.

Gentlemen:

We are in receipt of your notice of January 22nd and 860
recognize that there are quite a number of patents which should have been assigned to your Company. We are getting a complete list and copies of the patents for your full information.

We should have had more conferences over questions which involved our mutual interests, that points like you bring up could have been settled long ago. In my letter of December 5, 1941 I closed it by asking you to suggest a time when we could have a conference, to which you replied under date of December 16th—"Your request that this be done is agreeable to us but by reason of the pressure of 861
matters at this time, we trust it will be satisfactory to you should the conference be arranged for as soon as feasible after the turn of the year". To this I replied on December 17th—"Your suggestion that we get together after the new year is entirely agreeable to us, and I will await your pleasure as to when you desire the conference held". Nothing more was heard from you.

So perhaps both of us have been rather lax in some of these details, but we feel no real harm has been done. Under changing conditions there are several points which should have our attention, and I hope you will be willing

862 *Defendant's Exhibit M*

to have the conference after we have been able to get our patent copies and assignments prepared for you.

Both of us I am sure only want to do the fair thing, and such a conference will surely lead to such results.

Very truly yours,

President,
STOKES & SMITH CO.
(Sgd.) J. S. STOKES

J.S.Stokes:D

863

Defendant's Exhibit N.

May 2, 1944

Transparent-Wrap Machine Corp.,
313 Hudson St.,
New York 13, N. Y.

Attention of Mr. Henry Heide, Jr.
Secretary

864

Dear Mr. Heide,

I have not responded earlier to the letters of your Corporation, particularly those of April 17th and 29th (other than our conversations over the phone) for the reason that I wished to get further advice from other patent attorneys as to the soundness of the position taken by our new attorney Mr. Woodcock. Because of illness, our regular patent attorney has retired, and we have been giving some work to Mr. Woodcock, whose judgment on the terms of our contract we have questioned.

Defendant's Exhibit N 865

In view of this, we have taken the matter up with two prominent attorneys of long standing, and their conclusions line up more closely with those of Mr. Amend and Mr. Engel. We enclose for your information the letter from one of our advisors, Mr. Charles H. Howson, of Howson & Howson, in which you will find a very sane interpretation of our agreement. He analyzes what he terms the "ambiguous" wording of the old contract, and I feel gives a very common sense analysis of it.

The contract is not clear cut—the term assignment was never mentioned, though it was probably the intent. Under 866
the circumstances, we feel that this interpretation should prevail. I have always told you that we have never had any idea other than that our patents should be used to back up your agreement, so the discussion narrows down to the question of actual assignment.

We were certainly at fault in not submitting the inventions to you. The late Daniel Maxfield had charge of such work in our organization, and after his death the rest of us forgot all about it. His first patent happened to apply to the *contents* of the package and had a different bearing from the agreement, and this seemed to have led us off the 867
trail. We have no excuses about this and can only apologize for the breach in not submitting these matters to you. We never made a secret of anything, as a matter of fact we thought you knew all about it. However, nothing has happened which in any way affects the prosecution of the business, and there is nothing that is irremediable.

The big thing to look at is how well the business has been conducted. Our Company has certainly put its back into this enterprise and has only had one de re, that is to make it a great success to all hands. We were tireless in our efforts to improve the machine and to extend its use. We considered the patent protection none too strong and that

868 | *Defendant's Exhibit N*

the major protection had not so long to run. We started, consequently, to build up this wall of protection in every way possible, and the cost of this figures to some $7,000 to $8,000.

We have sent competent demonstrators to all parts of the country where the machines were used, and have spared no expense in obtaining satisfied customers. So as matters stand today, the machine has a splendid reputation and is well known through our advertising and exhibitions.

The war has put a tremendous crimp in the prosecution
869 of the business by government restrictions, but we have continued our efforts to sell and have now over 80 orders, with many more prospects when deliveries can be made.

This is the situation which exists today and we feel you gentlemen will agree with most, if not all, of these statements. So I repeat, the breach is remediable and no real harm has been done to the business. The efforts to increase the patent protection will help prolong the life of the patents considerably, and have really been a very important feature of our work. So I hope the matter may be looked at broadly, and remedies applied which will heal the breach
870 that is between us. As the patent assignment was apparently the chief cause of your dissatisfaction with us perhaps the settlement of this point, by making these assignments in recognition of the spirit of our agreement rather than its exact words, will meet the situation.

Yours very truly,

President
STOKES & SMITH CO.

Sgd. J. S. Stokes

J.S.Stokes:D
Enclosure

Appendix to Defendant's Exhibit N.

871

COPY

Howson & Howson
123 South Broad St.
Philadelphia 9

May 1, 1944

Mr. J. Stogdell Stokes
c/o Stokes & Smith Co.
Summerdale Station, Philadelphia, Pa.

Dear Mr. Stokes:

872

At your request I have carefully examined the license agreement of June 23, 1937, between Transparent-Wrap Machine Corporation and your Company, with particular reference to the question whether or not under that agreement, your Company should assign certain patents to the Licensor.

The only clause of the agreement upon which any such obligation could be based is Clause 12, requiring the Licensee to submit certain improvements to the Licensor and giving to the Licensor the option of applying for letters patent covering the same.

873

Upon first reading this clause, I was inclined to the view that the absence of an undertaking on the part of the Licensee, in express words, to make an assignment, created such an uncertainty as to the true intent of the parties as would cause a court of equity to refuse specific enforcement of such an obligation if asserted by the Licensor.

Upon further consideration, however, I have reached the conclusion, and it is my opinion, that the right granted to the Licensor, at its option, to apply for letters patent covering the improvements, together with the reference in the third sentence of the clause to "such additional letters * * * granted to the Licensor", necessarily contemplated

assignment of the applications to the Licensor; and to carry out the true intent and spirit of the clause your Company should assign to the Licensor any patents which may clearly come within the scope of the improvements referred to in Clause 12 of the agreement.

Upon the assumption that there is such an obligation to assign, you have also asked me to press an opinion upon the question whether such obligation would embrace Maxfield patents Nos. 2,145,941; 2,154,521 and 2,160,367, and Stokes No. 2,330,015.

875 I have examined these patents, and as to Maxfield No. 2,145,941 and No. 2,160,367, it seems to me quite clear that these have to do with the filling of the package rather than to the making and closing of the package. Maxfield No. 2,154,521, on the other hand, seems to me to relate to the making of the package rather than to the filling of the package or to its contents. Stokes No. 2,330,015 is a patent on a particular package or container and does not appear to me to be an improvement applicable either "to the making and closing of the package" or "to the filling of the package".

876 In Clause 12 of the agreement improvements "applicable to the Transwrap packaging machine and suitable for use in connection therewith", would be submitted to the Licensor if "applicable to the making and closing of the package, but not to the filling nor to the contents of the package". I do not think it can fairly be said of the Maxfield patents Nos. 2,145,941 and 2,160,367 that they are not applicable to the filling or to the contents of the package, and therefore, these patents would seem by the express terms of the contract to be excluded from the improvements assignable to the Licensor. In my opinion, Stokes No. 2,330,015 is not assignable because it is not directed to the making and closing of the package, but is a patent on a particular package itself. On the other hand, in my view,

Maxfield No. 2,154,521 can properly be contended to be directed, at least primarily, to the making of the package rather than to the filling of the package or to its contents, and I therefore am inclined to the view that this Maxfield patent should be assigned.

If any of these patents should be deemed to cover improvements applicable to the making and closing of the package, as well as improvements applicable to the filling or to the contents of the package, I do not believe it is possible to find, fairly, any clear expression of intent in Clause 12 of the agreement, that such patents were to be assigned 878
to the Licensor. As I have pointed out above, the express terms of Clause 12 require an assignment of improvements applicable to the making and closing of the package, but not to the filling of the package. Certainly there is no provision here for the assignment to the Licensor of a patent applicable primarily to the filling of the package. To warrant the specific enforcement by a court of equity of an agreement to assign an invention or a patent, the contract must be clear and free from ambiguity; and in my opinion, Clause 12 of the agreement under discussion cannot be said to require in clear and unambiguous terms an assignment to 879
the Licensor of patents directed primarily to improvements applicable to the filling or contents of the package, even if those same patents could in some aspects be said to have some application to the forming or sealing of the package.

I have studied these questions with care, and I believe the conclusions expressed are sound; but it should be pointed out that such questions depending upon the effort to ascertain, from the terms of the writing, the true intent of the parties to a rather complicated agreement, are, as usual, not free from difficulty; and the matter seems to me to be one for amicable adjustment.

Yours very truly,

(Sgd) CHARLES H. HOWSON

880 **Defendant's Exhibit O.**

DEPARTMENT OF COMMERCE
U. S. Patent Office
Washington

Applicant: Walter R. Zwoyer
Ser. No. 700,097
Filed Nov. 28, 1933
For Automatic Packaging Machine

881 Fraser, Myers & Manley
170 Broadway
New York, N. Y.

• • • • • • • • • • •

In the examination of this application it is found that applicant is claiming several separate and distinct inventions. Division is, therefore, required as follows:

Group I. Claims 1 to 8 inclusive, 10, to 16 inclusive, 18 and 19 are drawn to a wrapping machine, classifiable in Class 93, Division 17, as shown by each of the patents to Aldrich, Page, and Spencer.

882 Group II. Claims 9 and 17 are drawn to tube forming mechanism, likewise examinable in Division 17, Class 93-Tube Machines, as shown by the patent to Decoufle.

Group III. Claims 20, 21 and 22 are drawn to a cutting device examinable in Division 57, Class 164, as shown by each of the patents to Lebovitz and Johnson; and

Group IV. Claims 23 and 29 inclusive are drawn to a dispensing device examinable in Division 35, Class 221, as shown by each of the patents to Johnson and Ayars.

In view of the above requirement for division no further action will be given upon the merits of the claims until this application is limited to a single invention.

Examiner.

883

Opinion.

(Filed December 17, 1945.)

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,

Plaintiff,

against

TRANSPARENT-WRAP MACHINE CORPORATION,

Defendant.

Civ. 25-583.

884

CLANCY, D. J.

FINDINGS OF FACT.

1. Before June 23, 1937, the date of the contract plaintiff and defendant were not competitors. The machine covered by the defendant's patents did not compete with any machine then being manufactured by the plaintiff. 885
The acquisition of the license by the plaintiff enabled it to fill a void in its line of manufactured machines. None of the provisions of the contract either singly or in company with an other or with others tends to monopolize any line of business or substantially to lessen competition.

2. Patents 2,146,308 issued February 7, 1939, 2,146,831 issued February 14, 1939, 2,154,521 issued April 18, 1939, 2,199,708 issued May 7, 1940, 2,200,971 issued May 14, 1940, 2,257,433, issued September 20, 1941, 2,257,823 issued October 7, 1941, 2,259,866 issued October 21, 1941, 2,260,064 issued October 21, 1941, 2,294,215 issued August 25, 1942

and 2,294,220 issued August 25, 1942, are, each and all, for improvements applicable to the Trans-Wrap packaging machine and suitable for use in connection therewith and applicable to the making and closing of the package and not to the filling nor to the contents of the package.

3. None of the improvements embodied in the patents recited in finding 2 were submitted by the licensee to the licensor as required by paragraph 12 of the contract between the parties to afford licensor an opportunity to exercise its option declared in that paragraph to apply for
887 letters patent thereon. The licensor was thereby deprived of the other rights granted to it in such circumstances by paragraphs 11 and 12 of the contract between the parties. The licensee thereby breached the contract.

4. Defendant terminated the contract on May 10, 1944 by giving plaintiff due notices of breach and termination required by its terms.

5. The defendant has not been guilty of laches nor has anything done or omitted by it established any estoppel.

888 CONCLUSIONS OF LAW.

1. Paragraphs 11 and 12 of the contract are not invalid or unenforceable as contrary to law or to public policy and defendant is entitled to judgment dismissing the complaint.

2. The defendant is further entitled to judgment on its counterclaim that the plaintiff has violated its agreement and that plaintiff be required to transfer to it by assignment each and all of the patents recited in finding 2, and directed to make full disclosure to defendant of all improvements or additions to Trans-Wrap packaging machines or inventions, patent applications or patents made or owned

by it or in which it has any interest legal or equitable which inventions, applications and patents are applicable to and suitable for use in connection with the Trans-Wrap machine.

3. Costs are awarded the defendant.

The plaintiff contends that paragraphs 11 and 12 of the contract are invalid and unenforceable because "every patent represents an individual monopoly separate and different from the monopoly represented by every other 890
patent and it is now the established law that the utilization of the patent by its owner for the purpose of creating and maintaining a monopoly separate and different from and beyond the monopoly of his patent is contrary to public policy, constitutes improper use of the patents which prevents their enforcement and may even constitute violation of the Anti Trust Laws as an unreasonable restraint of competition." The contract involved in this case is dated June 23, 1937. The defendant's earliest patent was issued January 1, 1935. The contract is for ten years with extensions at the plaintiff's option. The plaintiff tendered 891
no evidence that the parties were or had been in competition at or before the making of the contract. The defendant proved, and no effort was made to contradict this evidence, that they were not in competition before the contract and had never been. Therefore plaintiff's theory apparently is that the contract on its face manifests illegality. The paragraphs it complains of require the submission to the defendant by the licensee of discoveries or inventions embodying improvements applicable to the Trans-Wrap machine; permit the exercise by the licensor of an option to patent any such discovery or invention; accord to the

licensee the right to obtain the patent should the licensor decline its option, and declare the right of the licensor in such event to the use, but not the exclusive use thereof, outside the territories covered by the license agreement. The authorities submitted by plaintiff to support its contention are *Ethyl Gas Co.* v. *U. S.*, 309 U. S. 436, and the numerous cases cited in that opinion, together with *Carbice Corp.* v. *American Patent Corp.*, 283 U. S. 27, and *Morton Salt Co.* v. *Suppinger*, 314 U. S. 488. These cases all reflect attempts by owners of patents to monopolize a product or processes
893 other than the one patented. *Nachman Corp.* v. *Kay Mfg. Corp.*, 139 F. (2d) 781 and *National Lock-Washer Co.* v. *G. K. Garrett*, 137 F. (2d) 255, are cited: they involved collateral agreements restraining competition. From the opinion in *Scott Paper Co.* v. *Marcalus Co. Inc.*, Supreme Court, November 13, 1945, the licensee quotes the language denouncing any attempted reservation by the patentee of the patent monopoly after its expiration. *U. S.* v. *Parker Rustproof Co.*, 61 F. Supp. 805 is stressed. There the Court was satisfied that a contract by the defendant to purchase a business whose competition had been so keen
894 that it had engendered patent litigation, was made with intent to violate the Clayton Act and maybe the Sherman Act. All of these cases are obviously irrelevant to the plaintiff's claim. The licensee here enjoys the use of the patents for this contract provides for its manufacture and sale of the machine embodying all the improvements. It enjoys the right to use them on any machine it makes as well as the Trans-Wrap machine. No limitation of commerce in it is insinuated—on the contrary any effort of the licensee less than its best, to manufacture, market, promote sales and sell machines breaches the contract. The royalty may accommodate market conditions and costs

and competition as well. The licensee continues to enjoy its use of the patents for improvements with extensions of the contract at its option. When the agreement terminates within its present time limit, licensor is in a secure position to continue the manufacture and sale of an up-to-date saleable machine embodying the improvements where, without his right to patented improvements, he would own an unsatisfactory machine and neither party could satisfy the trade. We are unable therefore to find anything any more objectionable in the defendant's ownership of a patent or patents, the manufacture under which is provided for in 896 the contract, than there would be in the plaintiff's ownership of it or them. The complaint is dismissed.

Defendant's counterclaim alleges the plaintiff's breach of contract in that eleven patents, which were put in evidence, were taken out by the plaintiff without its meeting the contract condition to submit each of the inventions embodied in the patents to the defendant to permit the exercise of the defendant's option to prosecute in its own behalf the patent application therefor. We find on the evidence that the plaintiff never at any time made any offer to meet its contract obligation to submit discoveries or in- 897 ventions to the defendant. Specifically nothing in exhibit 6 constitutes any effort to meet this obligation. The question then remains whether any of the eleven patents taken out by the plaintiff and recited in finding 2 meets the description of those whose submission to the defendant was first required. On the trial plaintiff contented itself with pointing out the use of the word "filling" in some of the claims of several of the patents. Additional argument was made in the brief that three patents do not refer to the making and closing of the package. None of these conten-

tions has any merit. The boundaries of a patentee's rights are marked "by the specifications and claims of the patent." *Ethyl Gas Co.* v. *U. S.*, supra. It is unnecessary as it would be fruitless to recite the specifications in all of the disputed patents. But as an illustrative answer to the plaintiff's contention, we will point out that in patent No. 2,146,308, the specifications recite at page 1, line 1, that the invention "relates to" the manufacture, filling and sealing of packages. At page 1, column 1, line 14, it is clearly made to appear that the filling operation is independent of and not
899 included in the patent and at page 1, column 1, line 46, it is declared that invention resides in the method of making packages. Throughout the specifications the references to filling show that the machine and its operation are purely passive to the filling operation; e.g., page 1, column 1, line 14; page 2, column 1, line 2; page 2, column 2, line 70. Examination of patents No. 2,199,708, No. 2,294,215 and No. 2,294,220 has satisfied us that plaintiff's opinion, that the first claim of each of those patents has nothing to do with the closing of the package, is erroneous.

There was testimony at the trial that a patent attorney
900 employed by the defendant made weekly examinations of the Patent Office Gazette for the purpose of informing the defendant of the issuance of patents which might be considered infringements of the Trans-Wrap patents. The witness's memory not being too clear, counsel stated that he had found carbon copies of letters which indicated that the patent attorney making the search for Trans-Wrap had reported the first seven patents enumerated in finding 2. "Carbon copies" may indicate that these were the defendant's own letters which puts the meaning of the statement in doubt. The witness stated that "patents of all kinds" were

seen. Just what this testimony amounts to is difficult to determine and it was the plaintiff's obligation to have it clarified since on it he based a claim that the defendant is estopped from asserting his rights and had been guilty of laches and the burden of proof was his on those defenses. As it stands we are unable to make any definite finding of the knowledge at any time in the possession of the defendant of the issuance of patents to the plaintiff. We observe here that nothing in exhibit K constitutes notice to the defendant of the plaintiff's patenting any inventions. For the sake of argument and only for the sake of argument, 902 we will assume that the defendant had knowledge shortly after their issue of each of the first seven of the patents recited in the finding 2, and of plaintiff's ownership of them. They were issued between February, 1939, and October, 1941. Plaintiff argues that the result of defendant's failure to protest its ownership of these patents resulted in their expending further monies in their continuous practice of procuring patents, whereby the defendant is estopped from setting up its claim and has been guilty of laches. There is not a whit of evidence to sustain either of these defenses. Although one of plaintiff's officers was a witness, there is 903 no evidence from him or from any other source, that the plaintiff suspected that defendant had any knowledge of its proceedings or did anything whatever in reliance on any assumption that defendant knew about the issuance of its patents, or on defendant's failure to complain to it of their issuance. They proceeded on their course without any consideration whatever of the conduct or the rights of the defendant. As a matter of fact the contracting parties, in

paragraph 14, have expressly disclaimed any basis for this defense or for the other defense of laches. No laches appear. The lapse of time between the defendant's assumed discovery of the patents procured by the plaintiff and its application to the plaintiff for redress under its contract wrought no consequences that we can identify. Plaintiff has pointed to none.

Justice between these parties can be done only by compelling plaintiff to transfer the patents it secured in breach of its agreement. *Pomeroy*, Second Edition, volume 5, 905 page 4883, section 2173; *West Disinfecting Co. v. U. S. Paper Mills*, 44 Fed. (2d) 803. The whole tenor of the contract shows that it was intended to place the licensor in a position to do business with an up-to-date machine at its expiration and in territories beyond that covered by the agreement during its lifetime. The reasonable expectation of improvements was a consideration of the contract. The expense incurred in prosecuting the patent applications was voluntarily incurred in breaching its direct obligation to the defendant. The injunction asked is denied. The patent law will secure the defendant's rights. There is a 906 precedent or two for the issuance of such an injunction but we are able to discern neither reason for its issuance nor use for its operation.

Dated: New York, N. Y.,
December 17, 1945.

JOHN W. CLANCY,
United States District Judge.

Final Judgment. 907

(Served—December 26, 1945.)

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY, *Plaintiff,* *vs.* TRANSPARENT-WRAP MACHINE CORPORATION, *Defendant.*	Civil Action No. 25-583

908

This cause having been brought on for a final hearing on the pleadings and proofs and after hearing arguments by counsel for plaintiff and defendant, it is now

ORDERED, ADJUDGED AND DECREED

1. That the complaint be and the same is hereby dismissed.

2. That plaintiff breached its agreement of June 23, 1937 with defendant and that pursuant to notice given by defendant said agreement terminated May 10, 1944. 909

3. That plaintiff assign to defendant within thirty (30) days after entry of this judgment the following Letters Patent of the United States:

910 *Final Judgment*

No.	2,146,308	Issued	Feb. 7, 1939
"	2,146,831	"	Feb. 14, 1939
"	2,154,521	"	Apr. 18, 1939
"	2,199,708	"	May 7, 1940
"	2,200,971	"	May 14, 1940
"	2,257,433	"	Sept. 30, 1941
"	2,257,823	"	Oct. 7, 1941
"	2,259,866	"	Oct. 21, 1941
"	2,260,064	"	Oct. 21, 1941
"	2,294,215	"	Aug. 25, 1942
"	2,294,220	"	Aug. 25, 1942

911 4. That plaintiff make to defendant, within thirty (30) days after entry of this judgment, full disclosure of all improvements or additions to Trans-Wrap packaging machines or inventions, patent applications or patents made or owned by it or in which it has any interest legal or equitable which inventions, applications and patents are applicable to and suitable for use in connection with the Trans-Wrap machine.

5. That defendant recover of plaintiff its costs and disbursements herein amounting to $49.40 and have judgment therefor.

912 Dated: New York, N. Y.
December 27, 1945.

Approved:

JOHN W. CLANCY
U. S. District Judge

Judgment rendered December 28th, 1945.

WILLIAM V. CONNELL
Clerk

Notice of Appeal.

913

[Filed—January 7, 1946.]

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY, *Plaintiff,* *vs.* TRANSPARENT-WRAP MACHINE CORPORATION, *Defendant.*	Civil Action No. 25-583

914

Notice is hereby given that Stokes & Smith Company, the plaintiff above named, hereby appeals to the Circuit Court of Appeals for the Second Circuit from the final judgment entered in this action on December 28th, 1945 as to each and every of the five enumerated paragraphs thereof.

Jan. 3, 1946.

915

DARBY & DARBY
By SAMUEL E. DARBY, JR., a partner
Attorneys for Appellant,
STOKES & SMITH COMPANY,
405 Lexington Avenue,
New York 17, New York.

To:

PENNIE, DAVIS, MARVIN & EDMONDS, ESQRS.,
247 Park Avenue,
New York 17, New York.

916

Stipulation as to the Contents of the Record on Appeal.

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,
Plaintiff,

vs.

917 TRANSPARENT-WRAP MACHINE CORPORATION,
Defendant.

Civil Action No. 25-583

Under the provisions of Rule 75(f) of the Rules of Civil Procedure it is hereby stipulated and agreed that the record on appeal in this cause shall comprise the following:

1. The statement required under Rule 13(4) of the Rules of the Court of Appeals.
2. The complaint, filed May 19, 1944.

918 3. The answer and counterclaim, filed June 12, 1944.

4. Plaintiff's reply to defendant's counterclaim, filed June 27, 1944.
5. Extracts as agreed on from the stenographer's minutes of the proceedings at the trial, November 8th-9th, 1945.
6. Findings of fact, conclusions of law, and opinion, filed December 17, 1945.
7. Final judgment entered December 28, 1945.
8. Notice of appeal, filed January 7, 1946.

Stipulation as to the Contents of the Record on Appeal 919

8a. This stipulation.

9. Stipulation of counsel as to the correctness of the record.

10. Clerk's certificate.

Plaintiff's Exhibits to be reproduced in the record:

1—Agreement between the parties, dated June 23, 1937.

2—Letter, dated January 22, 1944, to Stokes & Smith from Transparent-Wrap Machine Corporation.

3—Letter, dated April 17, 1944, from Transparent-Wrap 920
Machine Corporation to Stokes & Smith.

4—Letter, dated April 29, 1944, from Transparent-Wrap Machine Corporation to Stokes & Smith.

5—Fourteen Letters Patent of the United States:

Patent No.	2,145,941	issued	Feb.	7, 1939
" "	2,146,308	"	Feb.	7, 1939
" "	2,146,831	"	Feb.	14, 1939
" "	2,154,521	"	Apr.	18, 1939
" "	2,160,367	"	May	30, 1939
" "	2,199,708	"	May	7, 1940
" "	2,200,971	"	May	14, 1940
" "	2,257,433	"	Sept.	30, 1941
" "	2,257,823	"	Oct.	7, 1941
" "	2,259,866	"	Oct.	21, 1941
" "	2,260,064	"	Oct.	21, 1941
" "	2,294,215	"	Aug.	25, 1942
" "	2,294,220	"	Aug.	25, 1942
" "	2,330,015	"	Sept.	21, 1943

921

6—Letter, dated July 28, 1937, from Stokes & Smith to Transparent-Wrap Machine Corporation.

922 *Stipulation as to the Contents of the Record on Appeal*

7—Letter, dated October 29, 1937, from Stokes & Smith to Transparent-Wrap Machine Corporation.

8—Letter, dated September 1, 1939, to Stokes & Smith from Transparent-Wrap Machine Corporation.

10—Enumeration of experimental expense of plaintiff.

11—Stipulation of amounts expended by Stokes & Smith in advertising the Trans-Wrap Machine.

12—List of patent expense.

923 Defendant's Exhibits to be reproduced in the record:

A—Three letters Patent of the United States:

Patent No.	1,986,422	issued	Jan.	1, 1935
" "	2,037,555	"	April	14, 1936
" "	2,047,243	"	July	14, 1936

B—Letter, dated October 7, 1935 from Stokes & Smith to Mr. Zwoyer of Transparent-Wrap Machine Corporation.

C—Letter, dated October 29, 1935 from Stokes & Smith to
924 Transparent-Wrap Machine Corporation.

D—Letter, dated November 15, 1935 from Stokes & Smith to Transparent-Wrap Machine Corporation.

E—Letter, dated November 26, 1935 from Transparent-Wrap Machine Corporation to Stokes & Smith.

F—Letters of March 20, 1936 and May 25, 1936 from Stokes & Smith to Transparent-Wrap Machine Corporation.

G—Advertising folder published by Stokes & Smith.

Stipulation as to the Contents of the Record on Appeal 925

K—Letter, dated September 17, 1942 from Stokes & Smith to Transparent-Wrap Machine Corporation.

L—Letter, dated February 27, 1939, from Stokes & Smith to Transparent-Wrap Machine Corporation.

M—Letter, dated January 26, 1944 from Stokes & Smith to Transparent-Wrap Machine Corporation.

N—Letter, dated May 2, 1944 from Stokes & Smith to Transparent-Wrap Machine Corporation.

O—Requirement of division of Zwoyer application. 926

Exhibits to be treated as physical exhibits:

Defendant's Exhibits:

H—Strip of filled packages.

I—Strip of empty packages.

J—Copy of patent No. 2,383,352.

PENNIE, EDMONDS, MORTON & BARROWS
Attorneys for Defendant

DARBY & DARBY
Attorneys for Plaintiff 927

Dated: New York, New York,
January 9, 1946

928

Stipulation of Counsel as to Correctness of the Record.

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,
Plaintiff,

vs.

929 TRANSPARENT-WRAP MACHINE CORPORATION,
Defendant.

Civil Action No. 25-583

It is hereby stipulated and agreed that the foregoing is a true copy of the transcript of the record of the said District Court of the above entitled matter as agreed on by the parties.

Dated: March 1, 1946.

930

DARBY & DARBY
Of Counsel for Plaintiff-Appellant

PENNIE, EDMONDS, MORTON & BARROWS
Of Counsel for Defendant-Appellee

Clerk's Certificate.

931

UNITED STATES DISTRICT COURT,

SOUTHERN DISTRICT OF NEW YORK.

STOKES & SMITH COMPANY,

Plaintiff,

vs.

TRANSPARENT-WRAP MACHINE CORPORATION,

Defendant.

Civil Action No. 25-583

932

UNITED STATES OF AMERICA
SOUTHERN DISTRICT OF NEW YORK } ss.:

I, , Clerk of the District Court of the United States of America for the Southern District of New York, do hereby certify that the foregoing is the record on appeal in the above entitled matter as agreed on by the parties.

933

IN TESTIMONY WHEREOF I have caused the seal of the said Court to be hereunto affixed at the City of New York, in the Southern District of New York this day of in the year of our Lord One Thousand Nine Hundred and Forty-six and of the Independence of the United States of America the One Hundred and Seventieth.

Clerk.

[fol. 312] UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT, OCTOBER TERM, 1945

No. 262

(Argued April 2, 1946. Decided May 1, 1946)

Docket No. 20172

STOKES & SMITH COMPANY, Appellant,

v.

TRANSPARENT-WRAP MACHINE CORPORATION, Appellee

Before L. Hand, Swan and Frank, Circuit Judges

Appeal from a Judgment of the District Court for the Southern District of New York, in an Action for a Declaratory Judgment

Samuel E. Darby, Jr., for the appellant.
R. Morton Adams, for the appellee.

[fol. 313] L. HAND, Circuit Judge:

This is an appeal from a judgment, dismissing the plaintiff's complaint for a declaratory judgment, and directing it to assign eleven patents to the defendant. The parties are corporations organized under the laws of different states, and in the spring of 1944 they had come to a critical difference as to the effect of a contract, entered into between them on June 23, 1937. The defendant, on April 29, 1944, elected to terminate this contract as of the following May 10th, and thereby raised the question which the plaintiff wishes to have determined in this action. The facts are as follows. The defendant was the owner of three patents taken out in 1935 and 1936, upon the invention of one, Walter R. Zwoyer: the first, upon an original application, filed on November 28, 1933; the other two, upon divisional applications of the original. They were all for a machine to make a connected series of small transparent envelopes and to fill them with small pellets, such as pieces of hard candy and the like. The machine proved a success, and the defendant began making and selling it under the name, "Transwrap Packing Machine." The plaintiff had

been engaged in the business of making machinery to make and fill similar packages with powders—for the most part toilet powders—; and in 1935 it learned of the Zwoyer patents, and sought a license under them early in 1936. After preliminary negotiations not necessary to set forth, the parties executed the contract of June, 1937, out of which the present controversy arises, and the substance of which was as follows.

The defendant granted to the plaintiff an exclusive license under the Zwoyer patents in the United States, Canada and Mexico, as well as upon any patents for improve- [fol. 314] ments which it might secure during the life of the contract. The plaintiff promised to keep books and render accounts, and to pay royalties, fixed by elaborate provisions not relevant here. The defendant promised to communicate to the plaintiff what it knew about manufacturing the machines and about prospective customers and the like and to use its best efforts to push the sales under the patents. The contract was to last for ten years unless terminated as provided; but the plaintiff had an option to renew it for successive periods of five years, "until the expiration of the Patents above referred to and the expiration of any further Patents that may be granted to or acquired by the Licensor or Licensee, covering improvements in Transwrap Packaging Machines or inventions used, or capable of use by the Licensee in the manufacture thereof." This option was contingent 1.) upon notice to the defendant, 2.) upon prior performance by the plaintiff of all the conditions of the contract, and 3.) upon the fact that "the volume of sales of Transwrap Packaging Machines during the then current term of the license has been such as should reasonably be satisfactory to the Licensor." In the event of disagreement as to whether sales had been reasonably satisfactory, that question was to be settled by arbitration. The defendant promised to sell the plaintiff such of its manufacturing apparatus used in making the machines as the plaintiff wished, for which the plaintiff was to pay prices as should be agreed; also to sell such of the machines and parts of machines already manufactured, as the plaintiff wished. In case the contract was terminated before the ten years expired, the defendant promised to buy back this apparatus and these machines, and any apparatus and machines meanwhile made by the plaintiff, at a depreciation of twenty per cent. The

parties agreed not to challenge the validity of the Zwoyer [fol. 315] patents, and there were stipulations regarding the suits for infringement, and the like.

So far, the contract was concededly unobjectionable. The contest is as to the eleventh, twelfth, and fourteenth Articles, which are quoted in the margin,* and the important parts of which were as follows. Article XI is obscure, but we read the second sentence as meaning that the plaintiff promised to give the defendant an exclusive license in all territories not covered by the contract, under any patents upon improvements to the Zwoyer machine, so far as these should relate to making and closing the package. In Article XII the plaintiff promised, if it should invent any improvements to the Zwoyer machine which were suitable for use in making and closing Zwoyer packages, that

*"11. During the term of this license all improvements to Transwrap Packaging Machines, or new inventions used or capable of use in connection therewith, whether made by the Licensor or by the Licensee, shall be deemed included within the terms of this license, without any additional consideration, or license fee or royalty being due to the Licensor for the use thereof. It is understood and agreed, however, that the Licensor shall have the right to use, and license the use of, outside the several territories covered by this License Agreement, any improvement or addition to Transwrap Packaging Machines or any new inventions connected with such machines and used in making and/or closing the package, but not those applying to the filling or to the contents of the package, made, owned or controlled by the Licensee, but such right to use and enjoy such Patents or inventions shall be exclusive only with regard to their use in Transwrap Packaging Machines and Licensee shall have the free right to use and enjoy them in all other fields and in all other kinds and types of machines without the payment of any royalty to Licensor for such use."

"12. If the Licensee shall discover or invent an improvement which is applicable to the Transwrap Packaging Machine and suitable for use in connection therewith and applicable to the making and closing of the package, but not to the filling nor to the contents of the package, it shall submit the same to the Licensor, which may, at its

[fol. 316] it would submit them to the defendant which was given an option to apply for patents upon them. If the defendant did not exercise the option, the plaintiff might itself apply for such patents; and if the defendant took out the patents, the contract would cover them, and the plaintiff would have a license under them without further royalties. Article XIV specified those events upon which the defendant could terminate the contract. For the most part these were breaches by the plaintiff, but included were the filing of a petition by the plaintiff for reorganization under what is now Chapter X of the Bankruptcy Act and any court injunction of the payment of royalties.

The parties continued under the contract until January 22, 1944, when the defendant learned that the plaintiff had applied for four patents, to which in a letter written on that day it claimed the right, and of which it demanded an assignment under Article XII. The plaintiff answered [fol. 317] on January 26th, "that there are quite a number

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option, apply for Letters Patent covering the same. In the event of the failure of the Licensor to apply for Letters Patent covering such additional improvements, inventions or patentable ideas, the Licensee may apply for the same. In the event that such additional Letters Patent are applied for and are granted to the Licensor, they shall be deemed covered by the terms of this License Agreement and may be used by the Licensee hereunder without any further consideration, license fee or royalty as above provided. In the event that any such additional improvements are patented by the Licensee for use in connection with Transwrap Packaging Machines, (after the refusal or failure of the Licensor to apply for Patents thereon), the Licensor may, nevertheless, have the use but not the exclusive use of the same outside of the several territories covered by this License Agreement. The expenses of obtaining any such Patents shall be paid by the party applying therefor.

"The Licensor agrees to apply for and pay the expenses of obtaining any renewals of said Patents owned or acquired by it. The Licensee shall have the full right to use and enjoy any of the said inventions in its other machines which do not compete with Transwrap Packaging Machines and to license others so to do, but in such case the Licensee shall re-imburse the Licensor for its cost in

of patents which should have been assigned to your Company. We are getting a complete list and copies of the patents for your full information." Apparently the parties had unsatisfactory negotiations before April 17, for on that day the defendant wrote the plaintiff that its failure to offer the defendant the opportunity to take out various patents was a breach of the contract which should be submitted to arbitration. This letter it followed on April 29th by another in which it said: "Because of your failure to cure the default specified in our letter of January 22, 1944, within thirty days after written notice of such default, we have elected to terminate the license agreement on May 10, 1944." The plaintiff answered both these letters on May second, admitting that it was "certainly at fault in not submitting the inventions to you"; that it had "no excuses about this and can only apologize for the breach in not submitting these matters to you"; and that "nothing has happened [fol. 318] which in any way effects the prosecution of the business, and there is nothing that is irremediable." This letter concluded that: "perhaps the settlement of this

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obtaining the Patents on said inventions on a basis to be agreed upon by the parties and if they fail to agree, the same shall be referred to arbitration as hereinafter provided."

"14. In the event that any one or more of the following events (herein termed events of default) shall occur and such default shall not be cured within thirty days after written notice thereof by the Licensor to the Licensee, this agreement may be terminated by the Licensor in the manner hereinafter provided.

The following and each of the following shall constitute events of default:

(a) Failure of the Licensee to keep true and accurate books of account;

(b) Failure of the Licensee to permit the Licensor or its duly authorized representatives to examine and inspect the same;

(c) Failure of the Licensee to render to the Licensor full and accurate statements in writing of all Transwrap Packaging Machines manufactured and sold by it;

point, by making these assignments in recognition of the spirit of our agreement rather than its exact words, will meet the situation."

The plaintiff obviously changed its mind shortly thereafter, because the complaint at bar was filed on the 19th of May, 1944, and the summons was served on the 23rd. The defendant filed a counterclaim on June 15th, demanding an assignment of fourteen patents which it asserted to be within the contract, but three of which it withdrew upon the trial. The judge found that the contract was lawful throughout, not being within the doctrine of such decisions as *Ethyl Gasoline* v. *United States*, 309 U. S. 436; *Morton* [fol. 319] *Salt Company* v. *G. S. Suppiger Co.*, 314 U. S. 488;

(d) Failure of the Licensee to pay the full amount of the license fees or royalties hereinabove provided for as and when the same shall be due and payable;

(e) If the Licensee shall be adjudicated a bankrupt, or shall file a Petition under Section 77-B of the Bankruptcy Act, or any Act amendatory thereof, or if the Licensee shall take advantage of any bankruptcy or insolvency act;

(f) If by reason of any action taken by or against the Licensee the payment of license fees or royalties shall be enjoined or suspended;

(g) If the Licensee shall be dissolved or liquidated (other than in connection with a corporate reorganization and the continuance of the business of the Licensee); and

(h) If the Licensee shall default in any of the terms, clauses, covenants and conditions of this License Agreement.

Should such an event of default have occurred and not been cured within thirty days after written notice thereof by the Licensor to the Licensee, this license shall be deemed terminated upon a date fixed in a further written notice of termination to be sent by the Licensor to the Licensee by registered mail, which date shall not be less than ten days after the expiration of the thirty days hereinabove referred to.

Failure of the Licensor to insist upon any of the terms, clauses, covenants and conditions of this License Agreement in any instance shall not, however, be deemed to be a waiver of default in subsequent instances."

and *Mercoid Corp.* v. *Mid-Continent Investment Co.*, 320 U. S. 661. He dismissed the complaint, held that the plaintiff had broken the contract without excuse, that the defendant had rightfully terminated it on May 10, 1944, and he directed the plaintiff to assign to the defendant the eleven patents in question, and to disclose to the defendant all improvements upon the "Transwrap Packing Machine," in which is had any interest.

The power of a patentee to make a license conditional upon the licensee's buying other goods only of him, first came up, so far as we can find, in *Heaton-Peninsula Button-Fastener Co.* v. *Eureka Specialty Co.*, 77 Fed. Rep. 288 (C. C. A. 6) (1896), where the court decided that, since the patentee had power unconditionally to forbid infringement, he might attach such conditions as he chose to a license. In 1902 the Supreme Court in *Bement* v. *National Harrow Co.*, 186 U. S. 70, carried this so far as to except from the Sherman Act patent licenses which fixed prices; and in *Henry* v. *A. B. Dick Co.*, 224 U. S. 1 (1912) it adopted the doctrine of *Heaton-Peninsula Button-Fastener Co.* v. *Eureka Specialty Co.*, *supra* (77 Fed. Rep. 288) in full. There was a strong dissent in that case, and the dissenters had their way the next year in *Bauer* v. *O'Connel*, 229 U. S. 1. The attempt which they then made to distinguish *Henry* v. *A. B. Dick Co.*, *supra* (224 U. S. 1), was acknowledged to be futile in *Motion Picture Co.* v. *Universal Film Co.*, 243 U. S. 502, 518, and the earlier decision was expressly overruled. Since then numerous decisions have held unlawful similar conditions upon a license; and in *Mercoid Corporation* v. *Mid-Continent Co.*, 320 U. S. 661, and *Mercoid Corp.* v. *Minneapolis-Honeywell Co.*, 320 U. S. 680, the doctrine was extended to [fol. 320] the separate constituents of a patented combination; so that now it is unlawful to make a license conditional upon the licensee's purchasing only from the patentee any one of those elements of which a combination claim is composed. Indeed, it appears from the discussion in the opinions (pp. 669, 673, 674, 677, 680), that the doctrine of contributory infringement is itself not wholly free from doubt.

The question here is whether the facts at bar fall within this doctrine. It is true that the defendant did not expressly exact as a condition upon its license under the Zwoyer patents that the plaintiff should buy anything of it; not even parts of the Zwoyer machine. Indeed, it was going out of business and could not have supplied the plain-

tiff, if it had exacted any such promise. While the contract remained in execution the plaintiff was as free as possible to buy what it liked, where it liked: the parts of the Zwoyer machine, or any improvements upon it. Nevertheless, when the contract ended for any reason, the situation became quite different; as is well illustrated by the very judgment here upon appeal. The defendant has cancelled the contract for the plaintiff's breach in refusing to tender its improvement patents; and by that cancellation it has resumed control over the Zwoyer patents themselves. The mere recapture of these patents did not of course impose any limitation of the plaintiff's freedom beyond that necessarily involved in a cancellation of the license, which was of course permissible. However, in spite of the termination of the contract the defendant will remain the owner of those improvement patents which the plaintiff should transfer to it, and under these the plaintiff will no longer have any license. The question is whether that did not impose an illegal limitation, which the defendant obtained as a condition of granting a license under its own Zwoyer patents. [fol. 321] While those patents themselves lasted, the defendant might argue that its ownership of the improvement patents could not limit the plaintiff's freedom, because the plaintiff could not sell the "Transwrap Packing Machine" without the defendant's consent anyway; and, since the improvement patents were by hypothesis improvements to that machine, any machine which embodied them must fall within the Zwoyer claims. That would indeed depend upon whether the Zwoyer claims covered those combinations of elements which were at least implied in the improvement claims; but we may assume that this would be the case. If so, the plaintiff's freedom to make, use and vend would not be impaired by the defendant's ownership of the improvement patents in addition to the Zwoyer patents. Even so, the plaintiff would lose that negative command over the art which ownership of the improvement patents would have given it. Had it not assigned these to the defendant, its own consent as well as the defendant's would have been necessary before any third person could make the improved "Transwrap Packing Machine." Whether centering a double monopoly in the defendant's hands, instead of leaving the two parties to use their patents competitively, is an unlawful feature of the contract, we need not, however, decide, for the following reasons.

The last Zwoyer patent will expire in 1953, and the eleven improvement patents will expire between 1956 and 1959, so that there will be a period of from three to six years during which, although the plaintiff will be free to make, use, or vend the original "Transwrap Packing Machine," the defendant will be able to compel the plaintiff to buy from it alone any improved "Transwrap Packing Machine." Thus the plaintiff will be required to buy from the defendant articles which, although patented, are not covered by [fol. 322] the Zwoyer patents. It is quite true that upon the sale of its business, had the defendant not included those patents, it could have made it a condition that the plaintiff should assign to it any improvement inventions it might make, and in that way it would have secured the plaintiff as its customer for all such improvements. The owner of all property, by withholding it upon any other terms, may, if he can, force others to buy from him; land is the best example and every parcel of land is a monopoly. But it is precisely in this that a patent is not like other property; the patentee may not use it to force others to buy of him things outside its four corners. If the defendant gets the plaintiff's patents, it will have put itself in that position, in part at any rate, by virtue of the compulsion of its own patents. We do not see what difference it makes, under the decisions we have cited, whether the plaintiff is compelled to buy all improvements from the defendant by means of a transfer of the plaintiff's patents, or by means of a contract; indeed, the compulsion in the first instance is more absolute than in the second.

It is urged that this provision was merely an incident to the defendant's sale of its business, including the Zwoyer patents; that it could not be expected to part with that business and those patents without protection, in the event of recapture upon the buyer's default; and that it should not be compelled to take back a mutilated business: that is, one in which it must forfeit any advances that the art had made meanwhile, advances which it was not unfair to suppose it might itself have made, had it not sold to the plaintiff. No one could have objected, had the defendant merely provided that upon recapture it should have a license for any improvements which the plaintiff had made. That would have left the plaintiff free from the defendant's control over the [fol. 323] improved "Transwrap Packing Machine" after 1953, and yet would have relieved the defendant of the

competitive handicap of being confined to the original machine. But with that the defendant was not content; on the contrary it has used the sanction of its patents to make sure that after they have expired, the plaintiff shall be at just that competitive disadvantage that it would itself have been under, if the contract had provided for its recapture of the Zwoyer patents without any license from the plaintiff to use the improvements.

We have been speaking of the period after the contract came to an end, and we do not forget that the plaintiff had an option to extend it, not only beyond the original term of ten years, but for successive periods of five years until the last of the improvement patents expired. The defendant might argue—though it has not done so—that this gave the plaintiff the opportunity to avoid the competitive handicap we have mentioned, from which it would suffer after 1953: all it need do was to keep on in the business. To this there are two answers. First, continuance in the business was not wholly within the plaintiff's power. The sales in the preceding period had to be "reasonably satisfactory" to the defendant. Moreover, if the plaintiff got into such financial straits that it must file a petition under Chapter X, it lost the contract even during the original first ten years; so too in case payment of the royalties was enjoined, whatever that meant. Second, and more important, the plaintiff was not competitively free to abandon the contract at the end of any of the periods. In 1947, when the original period would come to an end, and again in 1952 and 1957 when the next two succeeding periods would do the same, among those considerations which would certainly be [fol. 324] influential in its decision to renew, would be the position it would be in, of which we have spoken a moment ago: *i. e.*, that after 1953 it might feel itself forced to renew just because the improvement patents were in the defendant's hands. Moreover, that predicament might not end in 1959, the year when the last of the eleven patents in suit will expire; for these may not be the last improvements, and the plaintiff may be forced, either to cease all efforts to patent improvements, or to keep renewing the contract in order to escape the consequences of its own ingenuity. For these reasons we hold that the promise to assign the improvement patents was illegal, and cannot be enforced.

However, since the plaintiff has repudiated this promise, the defendant is excused from any further performance of

any of its own promises in the contract; for the fact that the plaintiff was privileged to repudiate, does not affect that result. The contract was originally bilateral, and it does not apportion the plaintiff's promises as separate considerations for the defendant's promises; nor can we say *a priori* how far the promise to assign the improvement patents determined the defendant's acceptance. In such circumstances it is the rule that a promisor is excused from performance when a counter promise which is the consideration for his own promise is repudiated for illegality. Williston on Contracts § 1780; Restatement of Contracts § 607. We do not know whether the contract was made in New York or Pennsylvania; but the rule is the same in both states. *Foley* v. *Speir*, 100 N. Y. 552; *Marsell* v. *Maires*, 203 App. Div. 646, affirmed 236 N. Y. 516; *Parthey* v. *Beyer*, 228 App. Div. 308 (semble) *Sayres* v. *Decker Automobile Co.*, 239 N. Y. 73, 77. *In Re Shannon's Estate*, 289 Pa. St. 251. A different question arises as to restoration to the *status quo ante*—"resti- [fol. 325] tution"—in a case where as here the promisee of the unlawful promise has substantially performed his own promises. Whether he may reclaim what he has given, is not necessarily governed by the same considerations that excuse his further performance. This question the parties have not argued; moreover, the record is not in such form that we could finally dispose of it, if they had. The proper course will therefore be to remand the cause to the district court without attempting to do more than declare that the plaintiff's promise to assign the improvement patents is unenforceable, and that the defendant is excused from any further performance under the contract, leaving for the new trial whether the defendant may have any affirmative relief by way of restitution; if so, what that relief shall be; if not, whether the continued existence of a license under the Zwoyer patents is continued performance of a promise, or restitution; and any other questions that may turn out to be relevant.

Judgment reversed; cause remanded.

SWAN, Circuit Judge, dissenting:

When a man sells his business on terms which make it possible that he may have to buy it back, it seems to me entirely reasonable for him to require the purchaser in that event to turn over any improvement patents which

have been taken out in the meantime. If the seller had no patent when he sold his business, a stipulation that patents thereafter taken out by the buyer in connection with the business should be assigned to the seller if the business was returned to him pursuant to the terms of the agreement, would in my opinion be valid—and my brother's argument [fol. 326] does not suggest the contrary. The situation would seem to be analogous to requiring an employee to assign inventions made in the course of his employment. *Guth* v. *Minnesota Mining & Mfg. Co.*, 72 F. 2d 385 (C. C. A. 7), cert. den. 294 U. S. 711. Even if the seller of the business owned a patent under which the buyer received a license, a stipulation that any improvement patents should belong to the licensor would formerly have been sustained. See *Allbright-Nell Co.* v. *Stanley Hiller Co.*, 72 F. 2d 392 (C. C. A. 7). Recent Supreme Court cases upon which my brothers rely have established the principle that "the owner of a patent may not employ it to secure a limited monopoly of an unpatented material used in applying the invention." *Mercoid Corp.* v. *Mid-Continent Co.*, 320 U. S. 661, 664. The application of that principle to the case at bar requires an extension of the doctrine to very different facts and I can see no valid reasons for so extending it. In my opinion the judgment should be affirmed.

[fol. 327] UNITED STATES CIRCUIT COURT OF APPEALS, SECOND CIRCUIT

At a Stated Term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the United States Courthouse in the City of New York, on the 1st day of May, one thousand nine hundred and forty-six.

Present: Hon. Learned Hand, Hon. Thomas W. Swan, Hon. Jerome N. Frank, Circuit Judges.

STOKES & SMITH COMPANY, Plaintiff-Appellant,

v.

TRANSPARENT-WRAP MACHINE CORPORATION, Defendant-Appellee.

Appeal from the District Court of the United States for the Southern District of New York.

This cause came on to be heard on the transcript of record from the District Court of the United States for the Southern District of New York, and was argued by counsel.

On consideration whereof, it is now hereby ordered, adjudged, and decreed that the judgment of said District Court be and it hereby is reversed with costs, and cause remanded for further proceedings in accordance with the opinion of this Court.

It is further ordered that a Mandate issue to the said District Court in accordance with this decree.

Alexander M. Bell, Clerk.

[fol. 328] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. Stokes & Smith Company v. Transparent-Wrap Machine Corporation. 262. Judgment. United States Circuit Court of Appeals, Second Circuit. Filed May 1, 1946. A. M. Bell, Clerk.

[fol. 329] IN THE UNITED STATES CIRCUIT COURT OF APPEALS, FOR THE SECOND CIRCUIT, OCTOBER TERM, 1945

No. 262

Docket No. 20172

STOKES & SMITH COMPANY, Plaintiff-Appellant,

v.

TRANSPARENT-WRAP MACHINE CORPORATION, Defendant-Appellee

PETITION FOR REHEARING

Now comes Transparent-Wrap Machine Corporation, defendant-appellee in the above-entitled action, and files this petition for a rehearing and, for grounds thereof, alleges the following:

Point I

Legality of Clause 12—This Court, in holding Clause 12 illegal and unenforceable, has, we believe, overlooked the interpretation which the Supreme Court in the *Hartford Empire* case,[1] decided after the *Mercoid* case,[2] has given its [fol. 330] own decisions in the so-called "misuse" cases, namely, (a) that a requirement that a licensee assign improvement inventions is not in itself illegal, and (b) that under the "misuse" doctrine the alleged misuse must be one which in itself violates the laws against restraint of trade (whether statutory or common law).

(a) In the *Hartford Empire* case, decided in January, 1945, the Supreme Court refused to enjoin the patent owners from inserting and enforcing license provisions which would require the licensee to assign improvement inventions to the licensor, and the Court thus necessarily recognized that there is nothing illegal about such a clause *per se* even in a patent license.

Such an injunction had been granted by the lower court (see Paragraph 29 set forth at 323 U. S. 422) and the Supreme Court revised this paragraph (p. 424) in two

[1] *Hartford Empire Co.* v. *U. S.*, 323 U. S. 386 (1945).

[2] *Mercoid Corp.* v. *Mid-Continent Co.*, 320 U. S. 661 (1944).

ways, (a) to permit freedom of license with respect to inventions other than those which had formed the basis of the conspiracy in violation of the anti-trust laws, namely, "feeders, formers, stackers, and lehrs", and (b) to permit freedom of license even in these cases subject only to the limitations set forth with respect to Paragraph 24(b). Paragraph 24(b), itself was similarly modified by the Supreme Court; it is set forth on page 413 and the modification by the Supreme Court is set forth on pages 417-418. As modified it requires the patent owners to license such patents at a reasonable royalty, but says nothing about preventing a requirement that improvements be assigned by licensee.

(b) In the *Hartford Empire* case, the Supreme Court also said (page 415) referring to two of its own decisions in the so-called "misuse" cases, namely, the *Morton Salt* case[3] and the *B. B. Chemical* case,[4] "But those cases [fol. 331] merely apply the doctrine that, so long as the patent owner is using his patent in violation of the anti-trust laws, he cannot restrain infringement of it by others."

This is in accord with the statement in the *Mercoid* case, at page 666, "The patent is a privilege. But it is a privilege which is conditioned by a public purpose. It results from invention and is limited to the invention which it defines. When the patentee ties something else to his invention, he acts only by virtue of his right as the owner of property to make contracts concerning it and not otherwise. He then is subject to all the limitations upon that right which the general law imposes upon such contracts." The Supreme Court makes it clear that the basis of its decision is that if the contract is otherwise illegal, it is *not saved* by the fact that it is a patent license saying, "The contract is not saved by anything in the patent laws because it relates to the invention."

The misuse in the *Mercoid* case was such that it constituted, in and of itself, a restraint of trade, and this is made explicit at page 667 where the Court said, "The patent is employed to protect the market for a device on which no patent has been granted. But for the patent such restraint

[3] *Morton Salt Co.* v. *G. S. Suppiger Co.*, 314 U. S. 488 (1942).

[4] *B. B. Chemical Co.* v. *Ellis*, 314 U. S. 495 (1942).

on trade would plainly run afoul of the anti-trust laws. If the restraint is lawful because of the patent, the patent will have been expanded by contract. That on which no patent could be obtained would be as effectively protected as if a patent had been issued."

In this connection we wish to emphasize (1) the fact that Transwrap and Stokes & Smith were not competitors when they entered into the agreement and that the machinery that Stokes & Smith was then making was not machinery for making packages similar to Transwrap's packages or otherwise, but was a different type of machinery, namely machinery for wrapping packages and for filling packages; (2) that the last paragraph of clause 12 reserved to Stokes & Smith full right to make use of its improvement inven- [fol. 332] tions in its own business and to license others in similar businesses—and that this was so whether the Transwrap business was eventually returned to Transwrap or was continued by Stokes & Smith; and (3) that clauses of the type of Clause 12 providing for assignment of improvements have been so commonly employed for many years that they are included in the form books.[5]

Petitioner submits that the Court should be slow to disregard the limits clearly indicated by the Supreme Court where to do so would upset widespread property rights based on such agreements.

Point II

Termination of License and Right to Restitution—In the event that the Court adheres to its ruling on the legality of Clause 12, petitioner submits that the Court should decide (a) that the license is at an end, and (b) the substantive right to restitution, instead of leaving these matters to the Court below. All facts necessary to a determination of these matters are now before this Court and a reference for a later determination of the trial court will result in a delay prejudicial to petitioner who desires to have its rights in this matter decied at the earlies possible date so that its future commercial plans will not be held in uncer-

[5] *See* Gordon's "Modern Annotated Forms of Agreement" (1945), p. 737, par. 3; also 1932 Edition, p. 674.

Zabel, "The Patent Royalty Contract" (1933), p. 184, par. 8.

tainty until after action by the trial court and a possible second appeal to this court.

From the facts before this Court, it appears that plaintiff, Stokes & Smith, had no vested interest in the Zwoyer patents, but merely a license. Inasmuch as a license is in legal effect merely continued forbearance from suit, petitioner submits that under the rule applied by this Court [fol. 333] namely, that Transwrap is excused from further performance, the Stokes & Smith license is terminated, and that this Court should so hold.

The license granted to Stokes & Smith although exclusive in part, did *not* include the exclusive right to use (R., p. 90, fol. 270, et seq.), and did not give power to grant sublicenses. (R., p. 91, fol. 272) nor did it by its terms extend for the full life of the patent (R., p. 95, fol. 284). Cases such as *Waterman* v. *Mackenzie*, 138 U. S. 252 (1891) and *Ind. Wireless Co.* v. *Radio Corp.*, 269 U. S. 459 (1926), which hold that an exclusive licensee's rights are sufficient to permit him to bring a suit on the patent when the patent owner refuses to do so, give the licensee this right not on the basis of any interest in the patent, but on the basis of the contract obligation and in order to prevent a failure of justice under those special circumstances.

The general rule is that a transfer short of the whole exclusive right under the patent is a mere license not an interest in the patent, for example, where the license is for a period less than the full term, *Moore Mfg. & Fdry. Co.* v. *Cronk Hanger Co.*, 69 Fed. 998 (C. C., N. D. N. Y., 1895), or where the licensee is obligated to use his best efforts, *Hatfield* v. *Smith*, 44 Fed. 355 (C. C., S. D. Ohio, W. D., 1890), or where his right *to use* is not exclusive, *Waterman* v. *Mackenzie*, supra; *Hatfield* v. *Smith*, supra.

The following cases recognize that a license is equivalent to an agreement not to sue. *Moto Meter Co.* v. *National Gauge & Equipment Co.*, 31 F. (2d) 994 (D. C., D. Del., 1929); *Am. Tel. & Tel. Co.* v. *Radio Audion Co.*, 281 Fed. 200 (D. C., D. Del., 1922).

From an analysis of the foregoing and [redacted]ilar cases, petitioner believes it will clearly appear that on the facts now before this Court and under the rule laid down by this [fol. 334] Court, all so-called license rights in Stokes & Smith terminated as a consequence of the refusal of Stokes & Smith to perform its obligations.

It is submitted that, the facts being before this Court,

the Court should decide the matter and thus avoid the prejudicial delay incident to a reference of this matter to the trial court and to a possible second appeal to this Court.

(b) The question of restitution did not arise in the Court below or at the argument and as this Court has noted the matter was not discussed in briefs or in argument on appeal.

Although the nature and extent of the restitution which should be ordered can appropriately be referred to the trial court for a decision on the basis of further facts and figures, petitioner believes that the substantive question as to the right to restitution should be decided by this Court and that all the essential facts necessary to the decision are now before this Court.

During the entire period in question, namely, until the filing of the complaint, the parties' operations were conducted in accordance with the terms of the agreement except for the breach by plaintiff. All of the essential relations between the parties necessary to a determination of the right to restitution thus appear from the agreement itself and are therefore now before this Court. We note that the Supreme Court, in remanding the *Hartford Empire* case, *supra*, to the district court for settlement of the remedial details did not fail to decide, at page 411, the substantive question of Hartford's right at least to a *quantum meruit* recovery, a matter of restitution.

It is submitted by petitioner that in order to avoid unnecessary expense and delay, the substantive right to restitution should be decided by this Court at this time, instead [fol. 335] of referring the matter to a trial court with the possibility of a second appeal to this Court from the ruling of the trial court.

Wherefore:

Petitioner prays that a rehearing of this cause be granted to permit full presentation of the matters herein set forth and modification of the decision of this Court in accordance therewith.

Respectfully submitted, Pennie, Edmonds, Morton & Barrows, Attorneys for Defendant-Appellee; R. Morton Adams, W. B. Morton, Jr. Of Counsel.

Certificate

I hereby certify that, in my opinion, this petition for rehearing is well founded in law and in fact, and that

it is presented in good faith and not for the purpose of delay.

R. Morton Adams, Counsel for Defendant-Appellee.

[fol. 336] UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SECOND CIRCUIT

STOKES & SMITH COMPANY, Appellant,

v.

TRANSPARENT-WRAP MACHINE CORPORATION, Appellee.

Before L. Hand, Swan and Frank, Circuit Judges

R. Morton Adams, for the petitioner.

Per CURIAM:

Petition for rehearing denied.

L. H., J. N. F., C. JJ.

Filed May 22, 1946.

[fol. 337] UNITED STATES CIRCUIT COURT OF APPEALS, SECOND CIRCUIT

At a Stated Term of the United States Circuit Court of Appeals, in and for the Second Circuit, held at the United States Courthouse, in the City of New York, on the 22nd day of May, one thousand nine hundred and forty-six.

Present: Hon. Learned Hand, Hon. Jerome N. Frank, Circuit Judges.

STOKES & SMITH COMPANY, Plaintiff-Appellant,

v.

TRANSPARENT-WRAP MACHINE CORPORATION, Defendant-Appellee.

A petition for a rehearing having been filed herein by counsel for the appellee,

Upon consideration thereof, it is

Ordered that said petition be and hereby is denied.

Alexander M. Bell, Clerk, by A. Daniel Fusaro, Deputy Clerk.

[fol. 338] [Endorsed:] United States Circuit Court of Appeals, Second Circuit. Stokes & Smith Company v. Transparent-Wrap Machine Corporation. Order. United States Circuit Court of Appeals, Second Circuit. Filed May 22, 1946. A. M. Bell, Clerk.

[fol. 339] Clerk's Certificate to foregoing transcript omitted in printing.

[fol. 340] SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1946

No. 208

ORDER ALLOWING CERTIORARI—Filed October 14, 1946

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Second Circuit is granted.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.